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Minnesota Timber Industry—An Assessment of Timber Product Output and Use, 1988

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Cover photo courtesy of Minnesota Extension Service.

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FOREWORD

In this bulletin we discuss recent Minnesota forest industry trends and report the results of a detailed study of forest industry, industrial roundwood production, and associated primary mill wood and bark residue in Minnesota in 1988. Such detailed information is necessary for intelligent planning and decisionmaking in wood procurement, forest resource management, and forest industry development. Likewise, researchers need current forest industry and industrial roundwood information for planning projects.

Special thanks are given to the primary wood-using firms that supplied information for this study and to the Minnesota Department of Natural Resources for their diligent efforts in data collection and followup. Their cooperation is greatly appreciated.

All board foot data in this report have been converted to International 1/4-inch scale by applying a multiplier of 1.08 to all saw log volume reported in Scribner Decimal C scale by sawmills, a multiplier of 1.04 to all veneer log volume reported in Scribner Decimal C scale by veneer mills, a multiplier of 1.38 to all saw log volume reported in Doyle scale by sawmills, and a multiplier of 1.14 to all veneer log volume reported in Doyle scale by veneer mills.

The last published Forest Service report from a detailed study of all industrial roundwood output in Minnesota came out in 1975. Most comparisons in this report are with the 1975 study results.

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Minnesota Timber Industry—An Assessment of Timber Product Output and Use, 1988

W. Brad Smith and Rick Dahlman

HIGHLIGHTS

PRIMARY TIMBER INDUSTRY—INDUSTRIAL ROUNDWOOD

- Industrial roundwood production rose from 156.4 million cubic feet in 1975 to 223.8 million cubic feet in 1988. Annual production increases averaged 6 percent for hardwoods, but softwood production showed no significant gains.
- Pulpwood accounted for 70 percent of all industrial roundwood production in 1988.
- Aspen supplied 61 percent of the total growing-stock harvest in 1988.
- Log and bolt receipts at active mills were 218.5 million cubic feet. Hardwood receipts rose 96 percent and softwood receipts rose 46 percent since 1975.
- Total material harvested from timberland for industrial roundwood (excluding residential fuelwood) was 327.7 million cubic feet. Growing stock accounted for 69 percent (225.5 million cubic feet) of this total. As a result of logging operations, 103.9 million cubic feet of sound material was left in the woods in 1988. This residual material included tops, limbs, growing-stock residues, and cull material.

In terms of volume of wood used, pulp mills dominate Minnesota forest industry; but sawmills far outnumber any other mill category. There were 724 mills of all types operating in Minnesota in 1988. Sixty-one percent of these mills were in the Aspen-Birch and Northern Pine Forest Survey Units. The Forest Survey Units of Minnesota are shown in figure 1.

PULPWOOD

- Minnesota produced a near record high 2.13 million cords of pulpwood (including residues) in 1988. This volume was only 1 percent lower than the record high of 2.15 million cords in 1984. Pulpwood comprises all fiber based products made from roundwood including particleboard, oriented strand board (OSB), and waferboard.
- Aspen constituted 70 percent of the roundwood cut for pulpwood. The introduction of waferboard and OSB, along with new and expanded paper mills, has further increased the dominant position of aspen for pulpwood in Minnesota (fig. 2). Since 1982 aspen pulpwood production increased 73 percent while total production increased 44 percent.

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Rick Dahlman is a Marketing and Utilization Specialist with the Minnesota Department of Natural Resources, Division of Forestry. He received a B.S. degree in forest resources from the University of Minnesota and is working toward a masters degree in forest ecology. He joined the DNR in 1979 after working in private industry.

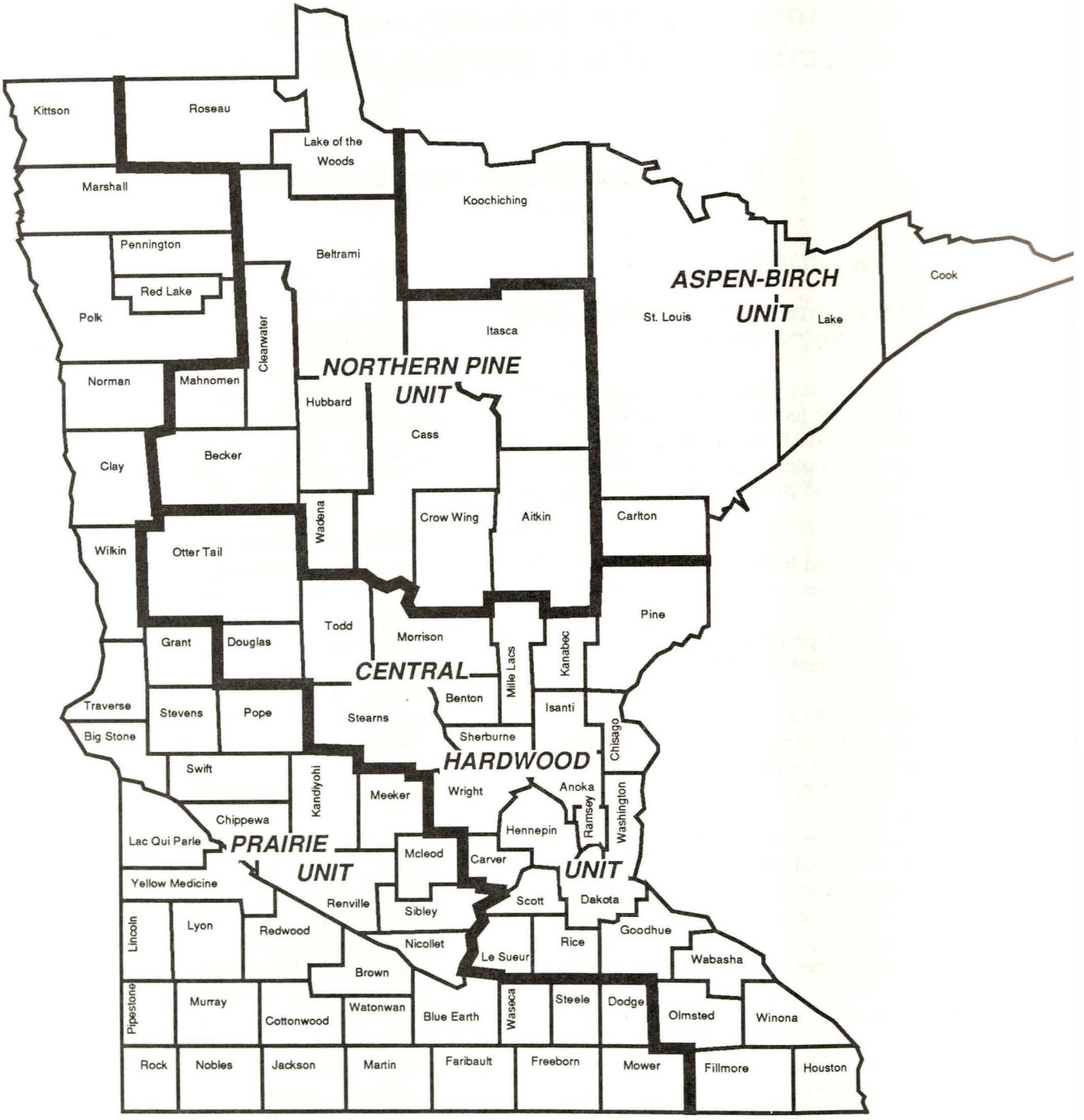

Figure 1.—*Forest Survey Units in Minnesota.*

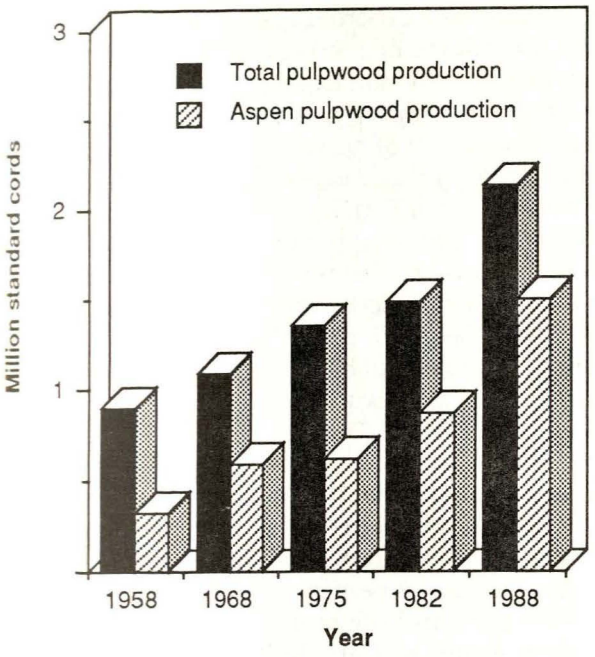

Figure 2.—*Pulpwood production of aspen and all species in Minnesota for selected years.*

- Annual production of aspen, the leading pulpwood species, has increased nearly five-fold during the last 30 years with production of 0.32 million cords in 1958 and 1.50 million cords in 1988.

- Minnesota pulp mills have traditionally procured most of their wood requirements from within the State. This remains true, only small amounts of balsam fir and aspen roundwood and softwood mill residues were imported from Wisconsin.

- Exports of pulpwood to other States are minimal as well with 94 out of every 100 cords of Minnesota pulpwood cut in 1988 remaining in the State.

SAW LOGS

- Loggers delivered 307 million board feet of saw logs to saw mills in 1988, up 151 million board feet (97 percent) from 1975.

- Principal saw log species harvested were aspen (82 million board feet), red oak (47 million board feet), and pine (51 million board feet). White birch, red pine, aspen, ash, basswood, soft maple, and walnut saw log production has more than doubled since 1975.

- Major production gains since 1975 were in aspen (33 million board feet), red oak (33 million board feet), and red pine (32 million board feet) (fig. 3). White birch, basswood, white pine, jack pine, white oak, and ash all showed production gains of more than 5 million board feet. Declines since 1975 occurred in cedar, elm, and balsam poplar.

- Six percent of the Minnesota saw log production was exported in 1988. Primary hardwood exports were red and white oak shipped to Wisconsin and Iowa, while softwood exports consisted mainly of spruce and pine headed for Canada.

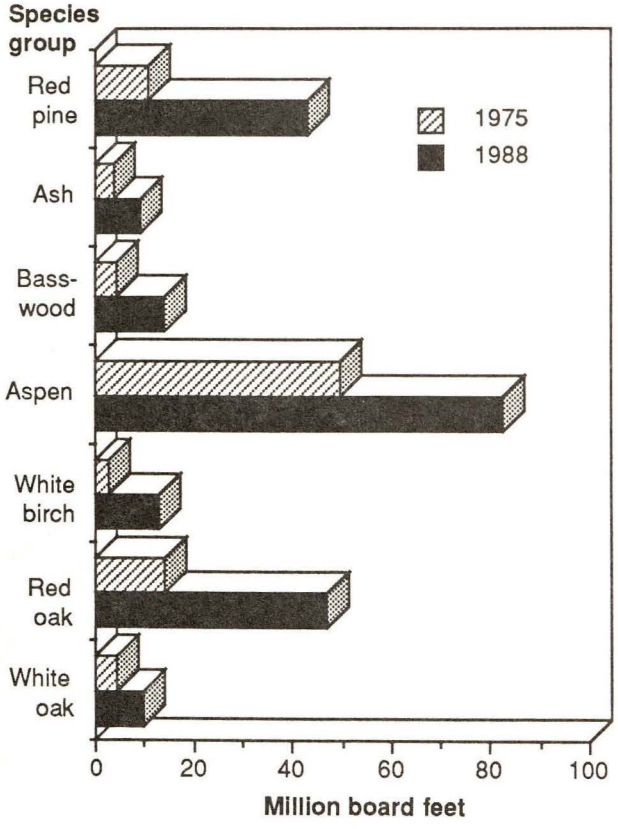

Figure 3.—*Saw log production for selected species groups in Minnesota, 1988.*

- Leading saw log producing counties (with more than 20 million board feet each) were Itasca, St. Louis, Koochiching, Cass, and Beltrami. Three other counties (Aitkin, Houston, and Cook) each cut more than 10 million board feet.

- Six counties in southeastern Minnesota produced 72 percent (26 million board feet) of the red oak saw log volume in 1988 (fig. 4).

- In 1988, 673 active (operating) sawmills received 306 million board feet of saw logs; in 1975, 620 sawmills received 153 million board feet.

- Minnesota imported a total of 16 million board feet of saw logs primarily from Wisconsin and Iowa. Major species imported as saw logs were red and jack pine from Wisconsin and red oak from Iowa.

VENEER LOGS

The veneer log figures contained in this report reflect only those logs that were received and processed by mills in the U.S. or Canada and ***do not*** *include logs exported overseas. In recent years the volume of overseas exports has risen dramatically. Foreign export data indicate that more than 100 exporters shipped more than 150 million board feet of hardwood logs overseas in 1988. Many of these logs came from forests in the North Central Region. Although it is difficult to determine the volume that came from any particular State in this region, it is certain that the impact is significant and that the volume exported may be greater than domestic veneer production. Future studies will attempt to quantify the volume of logs exported overseas from States in the North Central Region.*

- Loggers delivered 16.2 million board feet of veneer logs to veneer mills in 1988. Seventy-two percent of this volume remained in Minnesota, 18 percent was shipped to Michigan, and the remainder was sent to other States or Canada (fig. 4).

- White birch was the primary veneer species cut in Minnesota, followed by aspen and red oak. Basswood and red oak were the chief exports from Minnesota.

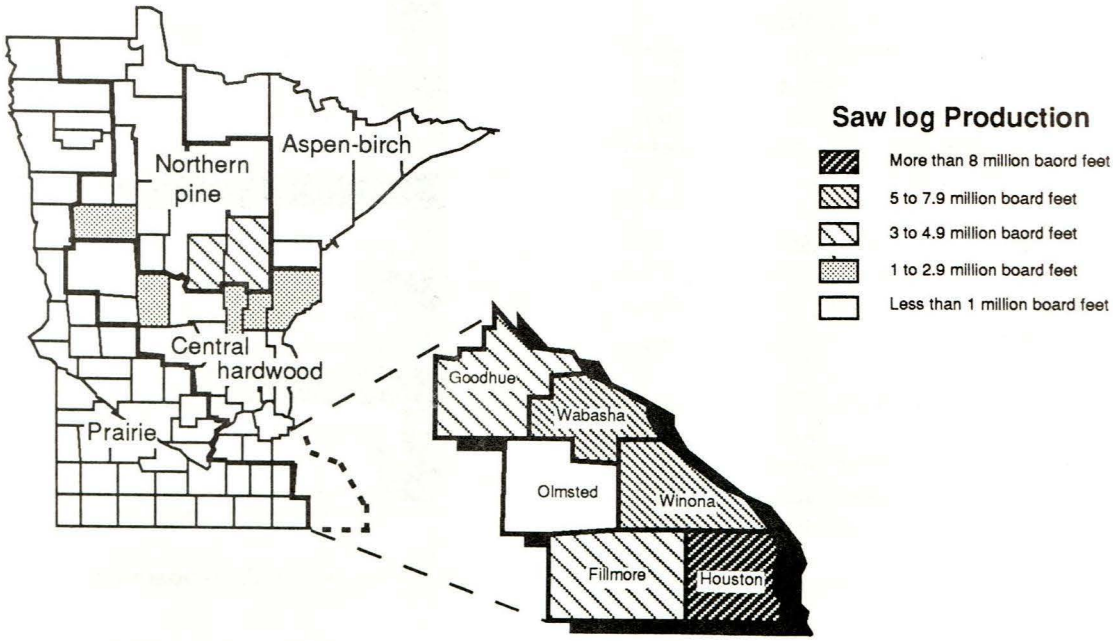

Figure 4.—*Red oak saw log production in Minnesota in 1988.*

OTHER PRODUCTS

- Other industrial roundwood products totalling 7.4 million cubic feet (3 percent of all industrial roundwood) were cut in Minnesota in 1988 (fig. 5). These products include commercial posts and poles, industrial fuelwood, shaving bolts, and excelsior bolts.

- Commercially produced posts (numbering 3.2 million) constituted 35 percent of the products in the "other" category; cedar was the leading post species. Eighty-two percent of the post volume was cut in the Northern Pine Survey Unit.

Residential fuelwood is a major nonindustrial product in Minnesota. The results of a 1988 residential fuelwood study are the subject of a separate Station publication.

TIMBER REMOVALS

- Timber removals from growing stock on timberland for industrial roundwood was 225.5 million cubic feet in 1988.

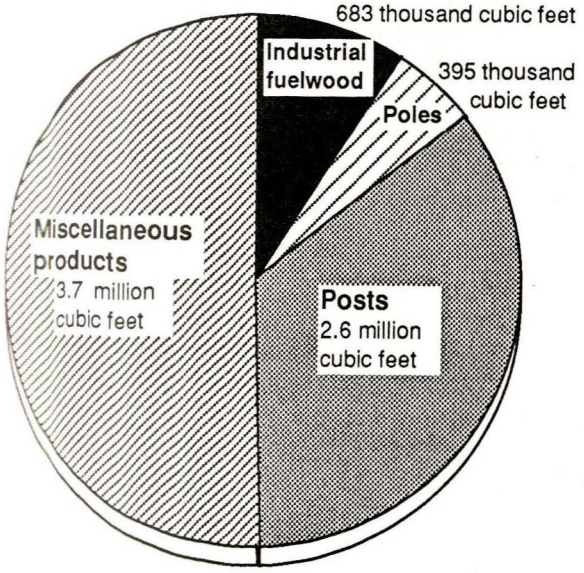

Figure 5.—*Distribution of miscellaneous products in Minnesota in 1988.*

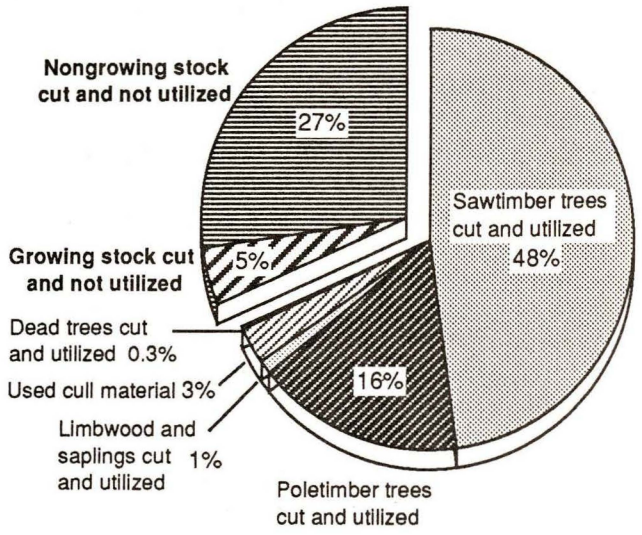

Figure 6.—*Distribution of material harvested from timberland for industrial roundwood in Minnesota, 1988.*

- Total material harvested for roundwood products *(excluding residential fuelwood)* from timberland was 327.7 million cubic feet. Thirty-two percent (103.9 million cubic feet) of this total was left in the woods as logging residue (fig. 6). Residue material included tops, limbs, cull material, and growing-stock material not used for products.

- Major species harvested in both growing stock and sawtimber were aspen, pine, and oak.

LOGGING RESIDUE

- During 1988 loggers in Minnesota generated an estimated 103.9 million cubic feet of logging residue. Logging residue includes all sound growng-stock and nongrowing-stock wood fiber left behind from trees cut or killed during logging operations and not subsequently used for products. Of the total residues, 15.0 million cubic feet were growing-stock material and 88.9 million cubic feet were nongrowing-stock material.

- Aspen accounted for 57 percent of all logging residues.

- Five counties—St. Louis, Itasca, Koochiching, Cass, and Beltrami—each produced more than 5 million cubic feet of logging residue. Five central and southern counties—Houston, Pine, Wabasha, Mille Lacs, and Winona—which are high oak production counties each had more than 1 million cubic feet of residues.

PRIMARY MILL RESIDUE

- Sixty-five percent or more of each residue class (coarse, fine, bark) generated at Minnesota primary mills was used.

- During 1988, Minnesota primary wood-using mills (except the pulp, particleboard, and waferboard mills) generated 419 thousand green tons of coarse residue, 254 thousand green tons of fine residue, and 190 thousand green tons of bark.

- Eighty-four percent of all coarse residues were used. Pulp mills consumed 42 percent (177 thousand tons) of all coarse mill residues for fiber products, and industry and households consumed 35 percent (147 thousand tons) for fuel.

- Forty-five percent of all fine residues (115 thousand green tons) and 49 percent of all bark (92 thousand green tons) were used for industrial fuel.

APPENDIX

STUDY METHODS

Data for this publication came from responses to a mail questionnaire (see following pages) sent to all known veneer mills, specialty mills (poles, piling, etc.), and all Minnesota primary sawmills that processed more than 100 thousand board feet of logs and bolts in 1988. Sawmills processing less than 100 thousand board feet were contacted to verify ongoing operations, and data from a 1985 MDNR study were duplicated to reduce the data collection workload. The latter mills constituted less than 10 percent of the total production. The impact of this procedure on sampling error is considered negligible.

The study was a cooperative effort of the Minnesota Department of Natural Resources (MDNR) and the North Central Forest Experiment Station (NCFES). All canvassing in Minnesota (except of pulp mills) was done by the MDNR, using mail and personal contact; followup of nonrespondents was by mail, telephone, and personal contact. MDNR utilization and marketing specialists provided estimates for a few Minnesota mills that did not furnish complete data, based on prior knowledge and contacts.

The NCFES mailed a questionnaire to all pulp mills and all out-of-State mills using Minnesota roundwood. Followup of nonrespondents was by mail and telephone.

Logging utilization factors were used to estimate growing-stock and sawtimber removals and the volume of logging residue generated during harvesting operations. These factors were determined for saw logs and pulpwood from the 1989-1990 Minnesota Logging Utilization Study conducted as part of the new Minnesota forest inventory by NCFES. Utilization factors for other products were established during earlier studies in the Lake States.

The NCFES edited and compiled the data.

Form Approved
OMB No. 0596-0010

LOGS AND OTHER WOOD PROCESSED IN 1988

MINNESOTA

This form is for reporting the quantities and kinds of logs and other wood processed by this plant in 1988, and the disposition of the wood residues resulting from this operation.

All replies will be held confidential and used only for statistical reports.

☐ Check here if you wish to receive a copy of the report resulting from this study.

Plant or company name: _____

Mailing address: _____

Plant location: _____

Person to contact about this report: _____

Types of wood processed in 1988. *Check only one kind of product. If more than one kind was received, fill out a separate form for each.*

14-15

01	☐	Saw logs & bolts-- includes veneer logs sawn
02	☐	Veneer logs & bolts cut into veneer
03	☐	Cooperage logs and bolts
06	☐	Piling
07	☐	Poles

09	☐	Industrial fuelwood
10	☐	Posts
11	☐	Charcoal wood
12	☐	Other (specify) _____

☐ Check here if no wood was processed in 1988 and return the form.

Total volume of above-checked product that was processed in 1988.

Conifer (pine, cedar, etc.) _____ (27-36) Hardwood (includes cottonwood) _____ (37-46)

DO NOT WRITE IN THIS BLOCK

Cols. 1-5 = **61100**

MILL	STATE	COUNTY
XXX	XX	XXX
6-8	9-10	11-13

FACTOR
XXX
47-49

50

A self-addressed envelope is provided for your convenience.

This survey is authorized by PL 93-378 as amended by PL 94-588. Your cooperation is appreciated and needed to make the results of this survey comprehensive, accurate, and timely, although you are not required to respond.

LOGS and OTHER WOOD PROCESSED IN 1988.

Do not include logs or bolts sold or transferred to other companies. Enter quantity processed opposite species in appropriate columns showing survey units, other states and Canada where the logs and bolts were harvested. The State map on page 4 shows unit boundaries. If the unit of measure is board feet, indicate the log rule or lumber tally. ☐ Doyle ☐ International ☐ Scribner ☐ Lumber tally
If cords, specify size _____. If weight, specify pounds per thousand board feet _____ or pounds per cord _____

Cols. 1-5 = 612xx or 613xx

Species	Unit of measure: ☐ Board feet ☐ Cords ☐ Cubic feet ☐ Lineal feet ☐ Pieces ☐ Weight ☐ Other _____		FROM MINNESOTA (enter name of county immediately below)								OTHER STATES AND CANADA (enter name below)	
			XXXXX	XXXXX	XXXXX	XXXXX	XXXXX	XXXXX	XXXXX	XXXXX	XXXXX	XXXXX
Cedar	1											
Balsam fir	2											
Hemlock	3											
Jack pine	4											
Red pine	5											
White pine	6											
Spruce	7											
Tamarack	8											
Ash	9											
Aspen	10											
Balsam poplar	11											
Basswood	12											
Beech	13											
White birch	14											
Yellow birch	15											
Cottonwood	16											
Elm	17											
Hickory	18											
Hard maple	19											
Soft maple	20											
Red oak	21											
White oak	22											
Walnut	23											
Other (specify)	24											
TOTAL												

DISPOSAL OF PLANT RESIDUES IN 1988 BY TYPE AND USE, for product checked on page 1

Instructions: Please enter your best estimate of the **percentage of each type of plant residue** that was used for the various purposes indicated

Cols. 1-5 = 615xx

DISPOSAL OF RESIDUE	BARK		COARSE RESIDUES (Suitable for chipping such as slabs, edgings, etc.)		FINE RESIDUES (Sawdust, veneer, clippings, etc. not suitable for chipping)	
	1 Conifer	2 Hardwood	3 Conifer	4 Hardwood	5 Conifer	6 Hardwood
	XX	XX	XX	XX	XX	XX
1. USED FOR:						
a. Manufacture of fiber products such as pulp, hardboard, or roofing felt 1	%	%	%	%	%	%
b. Charcoal or chemical wood 2	%	%	%	%	%	%
c. Industrial fuel at this or other mill 3	%	%	%	%	%	%
d. Domestic household fuel -- sold or given away 4	%	%	%	%	%	%
e. Miscellaneous uses such as livestock bedding, mulch, small dimension, and specialty items. 5	%	%	%	%	%	%
2. NOT USED: (Including land fill and residues burned as waste. 6	%	%	%	%	%	%
3. TOTAL	%	%	%	%	%	%

DEFINITION OF TERMS

Coarse mill residue.—Wood residue suitable for chipping such as slabs, edging, and veneer cores.

Consumption.—The quantity of a commodity, such as saw logs, utilized.

Fine mill residue.—Wood residue not suitable for chipping such as sawdust and veneer clippings.

Forest industry land.—Land owned by companies or individuals operating primary wood-using mills.

Forest Survey Unit.—A geographic area (group of counties) used by the Forest Inventory and Analysis Project to report periodic inventories and use of forest resources.

Industrial roundwood products.—Saw logs, pulpwood, veneer logs, poles, commercial posts, piling, cooperage logs, particleboard bolts, shaving bolts, lath bolts, charcoal bolts, and chips from roundwood used for pulp or board products.

Industrial roundwood production.—The quantity of industrial roundwood harvested in a geographic area.

Industrial roundwood receipts.—The quantity of industrial roundwood received by commercial mills in a geographic area regardless of the geographic source.

Logging residue.—The unused portions of trees cut or killed by logging.

National Forest land.—Federal land that has been legally designated as National Forest or purchase units, and other land under the administration of the USDA Forest Service.

Particleboard.—Panel product produced by compressing and bonding small particles of wood. Includes panels made from shavings, flakes, wafers, chips, sawdust, strands, slivers, or wood wool.

Primary wood-using mills.—Mills receiving roundwood or chips from roundwood for processing into products.

Primary wood-using mill residue.—Wood materials (coarse and fine) and bark generated at manufacturing plants from roundwood processed into principal products. These residues include wood products (by-products) obtained incidental to production of principal products and wood materials not utilized for some product.

Roundwood.—Logs, bolts, or other round sections cut from trees (including chips from roundwood).

Standard cord.—A stack of wood bolts (or the equivalent) encompassing 128 cubic feet of wood, bark, and air space. A cord of pulpwood in the North Central Region is assumed to contain 79 cubic feet of wood and 49 cubic feet of bark and air space. Most industries in Minnesota report cordwood volume in 100-inch cords or Lake States cords. These data are converted to 96-inch standard cord equivalents for this report.

State land.—Land owned by States or land leased to these governmental units for 50 years or more.

Timberland.—Forest land producing or capable of producing crops of industrial wood and not withdrawn from timber utilization by statute or administrative regulation. Generally, this includes areas suitable for growing crops of industrial wood in excess of 20 cubic feet per acre annually.

COMMON AND SCIENTIFIC NAMES OF TREE SPECIES MENTIONED IN THIS REPORT

SOFTWOODS

Jack pine ..... *Pinus banksiana*
Red pine ..... *Pinus resinosa*
Eastern white pine ..... *Pinus strobus*
Spruce
  White spruce ..... *Picea glauca*
  Black spruce ..... *Picea mariana*
Balsam fir ..... *Abies balsamea*
Tamarack ..... *Larix laricina*
Northern white-cedar ..... *Thuja occidentalis*

Other softwoods
Eastern redcedar ..... *Juniperis virginiana*
Scotch pine ..... *Pinus sylvestris*
HARDWOODS
White oak
White oak ..... *Quercus alba*
Bur oak ..... *Quercus macrocarpa*
Swamp white oak ..... *Quercus bicolor*
Red oak
Northern red oak ..... *Quercus rubra*
Black oak ..... *Quercus velutina*
Northern pin oak ..... *Quercus ellipsoidalis*
Hickory
Bitternut hickory ..... *Carya cordiformis*
Shagbark hickory ..... *Carya ovata*
White birch ..... *Betula papyrifera*
Yellow birch ..... *Betula alleghaniensis*
Hard maple
Black maple ..... *Acer nigrum*
Sugar maple ..... *Acer saccharum*
Soft maple
Red maple ..... *Acer rubrum*
Silver maple ..... *Acer saccharinum*
Ash
Black ash ..... *Fraxinus nigra*
White ash ..... *Fraxinus americana*
Green ash ..... *Fraxinus pennsylvanica*
Balsam poplar ..... *Populus balsamifera*
Aspen
Bigtooth aspen ..... *Populus grandidentata*
Quaking aspen ..... *Populus tremuloides*
Eastern cottonwood ..... *Populus deltoides*
American basswood ..... *Tilia americana*
Black walnut ..... *Juglans nigra*
Elm
American elm ..... *Ulmus americana*
Rock elm ..... *Ulmus thomasii*
Slippery elm ..... *Ulmus rubra*
Other hardwoods
Black cherry ..... *Prunus serotina*
River birch ..... *Betula nigra*
Butternut ..... *Juglans cinerea*
Black willow ..... *Salix nigra*
Boxelder ..... *Acer negundo*
Hackberry ..... *Celtis occidentalis*
Kentucky coffeetree ..... *Gymnocladus dioicus*

TABLE

Table 1.—Number of active primary wood-using mills in Minnesota, 1960, 1975, and 1988

Table 2.—Industrial roundwood receipts by type of mill in Minnesota, 1960, 1975, and 1988

Table 3.—Industrial roundwood production by species and product, Minnesota, 1988

Table 4.—Material harvested on timberland for industrial roundwood by source of material and species group, Minnesota, 1988

Table 5.—Minnesota pulpwood production by species group, 1946-1988

Table 6.—Minnesota pulpwood production by species group and destination, 1988

Table 7.—Pulpwood production by Forest Survey Unit, county, and species group, Minnesota, 1988

Table 8.—Pulpwood receipts in Minnesota by species group, 1946-1988

Table 9.—Pulpwood receipts in Minnesota by area of origin, 1960-1988

Table 10.—Minnesota pulpwood receipts by species group and area of origin, 1988

Table 11.—Saw log production and receipts in Minnesota by species group, 1975 and 1988

Table 12.—Saw log production by Forest Survey Unit, species group, and State of destination, Minnesota, 1988

Table 13.—Saw log production by Forest Survey Unit, county, and species group, Minnesota, 1988

Table 14.—Saw log receipts in Minnesota by Forest Survey Unit, species group, and State of origin, 1988

Table 15.—Veneer log production and receipts in Minnesota for selected years, 1960-1988

Table 16.—Veneer log production and receipts by species group in Minnesota, 1975 and 1988

Table 17.—Veneer log and bolt production in Minnesota by species and State of destination, 1988

Table 18.—Veneer log receipts in Minnesota by area of origin for selected years, 1960-1988

Table 19.—Veneer log and bolt receipts in Minnesota by species group and area of origin, 1988

Table 20.—Growing-stock removals from timberland for industrial roundwood by Forest Survey Unit, county, and species group, Minnesota, 1988

Table 21.—Sawtimber removals from timberland for industrial roundwood by Forest Survey Unit, county, and species group, Minnesota, 1988

Table 22.—Logging residues generated on timberland during industrial roundwood production by Forest Survey Unit, county, and species group, Minnesota, 1988

Table 23.—Residue produced at primary wood-using mills by type of material, type of use, and county, Minnesota, 1988

Table 1.--Number of active primary wood-using mills in Minnesota, 1960, 1975, and 1988

Kind of mill	1960	1975	1988
Sawmills			
Large 1/	1	8	14
Medium 2/	26	29	57
Small 3/	1,255	583	602
Total	1,282	620	673
Pulp mills 4/	9	9	10
Veneer mills	7	4	4
Other mills	47	17	37
Total	1,345	650	724

1/ Annual lumber production in excess of 5 million board feet.

2/ Annual lumber production from 1 million to 5 million board feet.

3/ Annual lumber production less than 1 million board feet.

4/ Includes flakeboard plants after 1978, formerly reported in "other mills" category.

Table 2.--Industrial roundwood receipts by type of mill in Minnesota, 1960, 1975, and 1988

(In million cubic feet)

	All species		
Kind of mill	1960	1975	1988
Pulp mills 1/	61.9	83.8	156.4
Sawmills	26.4	30.9	55.7
Other mills 2/	2.7	6.6	6.4
Total	91.0	121.3	218.5
	Softwoods		
Pulp mills 1/	29.1	28.8	33.3
Sawmills	11.5	9.7	22.4
Other mills 2/	0.1	0.3	0.9
Total	40.7	38.8	56.6
	Hardwoods		
Pulp mills 1/	32.8	55.0	123.1
Sawmills	14.9	21.2	33.3
Other mills 2/	2.6	6.3	5.5
Total	50.3	82.5	161.9

1/ Includes flakeboard plants after 1978, formerly reported in "other mills" category.

2/ Does not include treating plants or fuelwood receipts.

Table 3.--Industrial roundwood production by species and product, Minnesota, 1988

ALL UNITS

Species group	Saw logs		Veneer logs		Pulpwood		Industrial fuelwood		Poles		Posts		Other products	All products
	MBF 1/	*MCF 2/*	*MBF 1/*	*MCF 2/*	*Cords 3/*	*MCF 2/*	*Cords 3/*	*MCF 2/*	*Pieces*	*MCF 2/*	*Thou. pieces*	*MCF 2/*	*MCF 2/*	*MCF 2/*
SOFTWOODS														
Cedar	2,260	454	--	--	--	--	--	--	--	--	2,291	1,834	--	2,288
Balsam fir	4,186	839	--	--	170,513	13,364	--	--	--	--	--	--	2	14,205
Jack pine	34,950	7,057	--	--	92,670	7,304	--	--	6,800	40	413	329	306	15,036
Red pine	42,863	7,387	--	--	26,361	2,080	--	--	58,845	352	504	405	577	10,801
White pine	20,096	3,466	14	2	2,061	159	--	--	675	3	5	4	3	3,637
Spruce	7,470	1,505	--	--	145,681	11,420	--	--	--	--	--	--	1	12,926
Tamarack	253	48	--	--	10,713	839	--	--	--	--	15	12	--	899
Total	112,078	20,756	14	2	447,999	35,166	--	--	66,320	395	3,228	2,584	889	59,792
HARDWOODS														
Ash	9,502	1,541	498	80	2,393	188	1,950	129	--	--	--	--	--	1,938
Aspen	82,496	14,849	3,796	615	1,500,734	118,128	--	--	--	--	--	--	2,461	136,053
Balsam poplar	450	79	--	--	46,109	3,625	--	--	--	--	--	--	--	3,704
Basswood	14,339	2,349	1,769	288	--	--	--	--	--	--	--	--	3	2,640
White birch	13,152	2,148	7,896	1,284	13,348	1,049	5,750	379	--	--	--	--	236	5,096
Yellow birch	304	47	37	4	--	--	--	--	--	--	--	--	--	51
Cottonwood	3,998	641	348	58	--	--	--	--	--	--	--	--	--	699
Elm	8,120	1,316	143	19	--	--	300	19	--	--	--	--	--	1,354
Hickory	151	22	--	--	--	--	--	--	--	--	--	--	--	22
Hard maple	1,630	260	62	8	--	--	500	34	--	--	--	--	30	332
Soft maple	2,383	382	364	57	6,359	499	750	49	--	--	--	--	51	1,038
Red oak	47,134	8,704	989	158	--	--	800	52	--	--	--	--	1	8,915
White oak	10,121	1,850	158	26	--	--	300	21	--	--	--	--	42	1,939
Walnut	736	115	99	14	--	--	--	--	--	--	--	--	--	129
Other hardwoods	561	88	--	--	--	--	--	--	--	--	--	--	--	88
Total	195,077	34,391	16,159	2,611	1,568,943	123,489	10,350	683	--	--	--	--	2,824	163,998
All species	307,155	55,147	16,173	2,613	2,016,942	158,655	10,350	683	66,320	395	3,228	2,584	3,713	223,790

(Table 3 continued on next page)

(Table 3 continued)

ASPEN-BIRCH UNIT

Species group	Saw logs		Veneer logs		Pulpwood		Industrial fuelwood		Poles		Posts		Other products	All products
	MBF 1/	*MCF 2/*	*MBF 1/*	*MCF 2/*	*Cords 3/*	*MCF 2/*	*Cords 3/*	*MCF 2/*	*Pieces*	*MCF 2/*	*Thou. pieces*	*MCF 2/*	*MCF 2/*	*MCF 2/*
SOFTWOODS														
Cedar	1,330	270	--	--	--	--	--	--	--	--	250	201	--	471
Balsam fir	1,219	244	--	--	101,566	7,961	--	--	--	--	--	--	--	8,205
Jack pine	10,012	2,021	--	--	53,353	4,207	--	--	135	1	42	33	--	6,262
Red pine	14,755	2,543	--	--	16,610	1,311	--	--	12,117	73	114	91	100	4,118
White pine	10,578	1,822	--	--	1,683	133	--	--	34	0	--	--	--	1,955
Spruce	6,420	1,298	--	--	113,990	8,935	--	--	--	--	--	--	--	10,233
Tamarack	56	11	--	--	8,816	690	--	--	--	--	--	--	--	701
Total	44,370	8,209	--	--	296,018	23,237	--	--	12,286	74	406	325	100	31,945
HARDWOODS														
Ash	1,117	182	32	6	1,718	134	850	57	--	--	--	--	--	379
Aspen	29,803	5,368	3,055	497	581,165	45,744	--	--	--	--	--	--	315	51,924
Balsam poplar	22	4	--	--	29,300	2,306	--	--	--	--	--	--	--	2,310
Basswood	264	44	--	--	--	--	--	--	--	--	--	--	--	44
White birch	3,324	543	7,605	1,237	10,412	819	2,700	177	--	--	--	--	166	2,942
Yellow birch	3	0	--	--	--	--	--	--	--	--	--	--	--	0
Cottonwood	--	--	--	--	--	--	--	--	--	--	--	--	--	0
Elm	60	9	--	--	--	--	100	6	--	--	--	--	--	15
Hickory	--	--	--	--	--	--	--	--	--	--	--	--	--	0
Hard maple	55	9	--	--	--	--	100	7	--	--	--	--	8	24
Soft maple	33	5	--	--	3,021	236	500	32	--	--	--	--	24	297
Red oak	307	56	--	--	--	--	350	23	--	--	--	--	--	79
White oak	184	33	--	--	--	--	--	--	--	--	--	--	--	33
Walnut	--	--	--	--	--	--	--	--	--	--	--	--	--	0
Other hardwoods	--	--	--	--	--	--	--	--	--	--	--	--	--	0
Total	35,172	6,253	10,692	1,740	625,616	49,239	4,600	302	--	--	--	--	513	58,047
All species	79,542	14,462	10,692	1,740	921,634	72,476	4,600	302	12,286	74	406	325	613	89,992

(Table 3 continued on next page)

(Table 3 continued)

NORTHERN PINE UNIT

Species group	Saw logs		Veneer logs		Pulpwood		Industrial fuelwood		Poles		Posts		Other products	All products
	MBF 1/	*MCF 2/*	*MBF 1/*	*MCF 2/*	*Cords 3/*	*MCF 2/*	*Cords 3/*	*MCF 2/*	*Pieces*	*MCF 2/*	*Thou. pieces*	*MCF 2/*	*MCF 2/*	*MCF 2/*
SOFTWOODS														
Cedar	923	183	--	--	--	--	--	--	--	--	2,001	1,601	--	1,784
Balsam fir	2,867	576	--	--	68,057	5,334	--	--	--	--	--	--	2	5,912
Jack pine	24,552	4,958	--	--	38,781	3,055	--	--	6,665	39	371	296	264	8,612
Red pine	26,223	4,521	--	--	8,323	656	--	--	45,771	274	255	206	422	6,079
White pine	9,164	1,582	--	--	332	23	--	--	641	3	5	4	--	1,612
Spruce	1,050	207	--	--	31,496	2,471	--	--	--	--	--	--	--	2,678
Tamarack	161	30	--	--	1,897	149	--	--	--	--	15	12	--	191
Total	64,940	12,057	--	--	148,886	11,688	--	--	53,077	316	2,647	2,119	688	26,868
HARDWOODS														
Ash	5,095	831	132	21	591	47	1,100	72	--	--	--	--	--	971
Aspen	44,690	8,043	595	96	829,474	65,287	--	--	--	--	--	--	1,077	74,503
Balsam poplar	342	60	--	--	13,004	1,020	--	--	--	--	--	--	--	1,080
Basswood	5,728	941	6	1	--	--	--	--	--	--	--	--	--	942
White birch	9,219	1,510	226	37	1,773	139	3,050	202	--	--	--	--	42	1,930
Yellow birch	218	34	10	1	--	--	--	--	--	--	--	--	--	35
Cottonwood	154	24	--	--	--	--	--	--	--	--	--	--	--	24
Elm	2,496	408	20	3	--	--	200	13	--	--	--	--	--	424
Hickory	--	--	--	--	--	--	--	--	--	--	--	--	--	0
Hard maple	285	45	--	--	--	--	400	27	--	--	--	--	13	85
Soft maple	313	47	--	--	3,258	258	250	17	--	--	--	--	15	337
Red oak	9,051	1,675	8	1	--	--	450	29	--	--	--	--	--	1,705
White oak	968	177	--	--	--	--	300	21	--	--	--	--	--	198
Walnut	68	11	1	0	--	--	--	--	--	--	--	--	--	11
Other hardwoods	81	13	--	--	--	--	--	--	--	--	--	--	--	13
Total	78,708	13,819	998	160	848,100	66,751	5,750	381	--	--	--	--	1,147	82,258
All species	143,648	25,876	998	160	996,986	78,439	5,750	381	53,077	316	2,647	2,119	1,835	109,126

(Table 3 continued on next page)

(Table 3 continued)

CENTRAL HARDWOOD UNIT

Species group	Saw logs		Veneer logs		Pulpwood		Industrial fuelwood		Poles		Posts		Other products	All products
	MBF 1/	MCF 2/	MBF 1/	MCF 2/	Cords 3/	MCF 2/	Cords 3/	MCF 2/	Pieces	MCF 2/	Thou. pieces	MCF 2/	MCF 2/	MCF 2/
SOFTWOODS														
Cedar	2	--	--	--	--	--	--	--	--	--	40	32	--	32
Balsam fir	100	19	--	--	890	69	--	--	--	--	--	--	--	88
Jack pine	379	77	--	--	536	42	--	--	--	--	--	--	42	161
Red pine	1,870	321	--	--	1,428	113	--	--	957	5	135	108	55	602
White pine	350	61	14	2	46	3	--	--	--	--	--	--	3	69
Spruce	--	--	--	--	195	14	--	--	--	--	--	--	1	15
Tamarack	19	4	--	--	--	-	--	--	--	--	--	--	--	4
Total	2,720	482	14	2	3,095	241	--	--	957	5	175	140	101	971
HARDWOODS														
Ash	2,533	409	313	50	84	7	--	--	--	--	--	--	--	466
Aspen	7,660	1,378	146	22	85,949	6,771	--	--	--	--	--	--	1,069	9,240
Balsam poplar	85	15	--	--	3,805	299	--	--	--	--	--	--	--	314
Basswood	7,633	1,250	1,647	268	--	--	--	--	--	--	--	--	3	1,521
White birch	572	90	65	10	1,163	91	--	--	--	--	--	--	28	219
Yellow birch	75	12	27	3	--	--	--	--	--	--	--	--	--	15
Cottonwood	1,523	243	348	58	--	--	--	--	--	--	--	--	--	301
Elm	1,921	307	98	12	--	--	--	--	--	--	--	--	--	319
Hickory	149	22	--	--	--	--	--	--	--	--	--	--	--	22
Hard maple	1,233	197	62	8	--	--	--	--	--	--	--	--	9	214
Soft maple	1,744	281	343	54	80	5	--	--	--	--	--	--	12	352
Red oak	36,539	6,751	948	151	--	--	--	--	--	--	--	--	1	6,903
White oak	8,375	1,538	146	24	--	--	--	--	--	--	--	--	42	1,604
Walnut	371	57	98	14	--	--	--	--	--	--	--	--	--	71
Other hardwoods	395	61	--	--	--	--	--	--	--	--	--	--	--	61
Total	70,808	12,611	4,241	674	91,081	7,173	--	--	--	--	--	--	1,164	21,622
All species	73,528	13,093	4,255	676	94,176	7,414	--	--	957	5	175	140	1,265	22,593

(Table 3 continued on next page)

(Table 3 continued)

PRAIRIE UNIT

Species group	Saw logs		Veneer logs		Pulpwood		Industrial fuelwood		Poles		Posts		Other products	All products
	MBF 1/	*MCF 2/*	*MBF 1/*	*MCF 2/*	*Cords 3/*	*MCF 2/*	*Cords 3/*	*MCF 2/*	*Pieces*	*MCF 2/*	*Thou. pieces*	*MCF 2/*	*MCF 2/*	*MCF 2/*
SOFTWOODS														
Cedar	5	1	--	--	--	--	--	--	--	--	--	--	--	1
Balsam fir	--	--	--	--	--	--	--	--	--	--	--	--	--	0
Jack pine	7	1	--	--	--	--	--	--	--	--	--	--	--	1
Red pine	15	2	--	--	--	--	--	--	--	--	--	--	--	2
White pine	4	1	--	--	--	--	--	--	--	--	--	--	--	1
Spruce	--	--	--	--	--	--	--	--	--	--	--	--	--	0
Tamarack	17	3	--	--	--	--	--	--	--	--	--	--	--	3
Total	48	8	--	--	--	--	--	--	--	--	--	--	--	8
HARDWOODS														
Ash	757	119	21	3	--	--	--	--	--	--	--	--	--	122
Aspen	343	60	--	--	4,146	326	--	--	--	--	--	--	--	386
Balsam poplar	1	0	--	--	--	--	--	--	--	--	--	--	--	0
Basswood	714	114	116	19	--	--	--	--	--	--	--	--	--	133
White birch	37	5	--	--	--	--	--	--	--	--	--	--	--	5
Yellow birch	8	1	--	--	--	--	--	--	--	--	--	--	--	1
Cottonwood	2,321	374	--	--	--	--	--	--	--	--	--	--	--	374
Elm	3,643	592	25	4	--	--	--	--	--	--	--	--	--	596
Hickory	2	0	--	--	--	--	--	--	--	--	--	--	--	0
Hard maple	57	9	--	--	--	--	--	--	--	--	--	--	--	9
Soft maple	293	49	21	3	--	--	--	--	--	--	--	--	--	52
Red oak	1,237	222	33	6	--	--	--	--	--	--	--	--	--	228
White oak	594	102	12	2	--	--	--	--	--	--	--	--	--	104
Walnut	297	47	--	--	--	--	--	--	--	--	--	--	--	47
Other hardwoods	85	14	--	--	--	--	--	--	--	--	--	--	--	14
Total	10,389	1,708	228	37	4,146	326	--	--	--	--	--	--	--	2,071
All species	10,437	1,716	228	37	4,146	326	--	--	--	--	--	--	--	2,079

1/ Thousand board feet, International 1/4-inch rule.

2/ Thousand cubic feet.

3/ Standard cords are 128 cubic feet consisting of 79 cubic feet of wood and 49 cubic feet of bark and air space.

Table 4.-- Material harvested on timberland for industrial roundwood by source of material and species group, Minnesota, 1988

(In thousand cubic feet)

Species group	Growing stock				Nongrowing stock						Total material used for products	Total material not used	Total material harvested
	Used for products				Used for products								
	Saw-timber	Pole-timber	Residue	TOTAL	Limb-wood	Sap-lings	Cull trees	Dead trees	Not used	TOTAL			
SOFTWOODS													
Cedar	742	1,181	69	1,992	6	60	234	65	228	593	2,288	297	2,585
Balsam fir	9,082	4,618	346	14,046	485	0	8	12	5,946	6,451	14,205	6,292	20,497
Jack pine	11,450	2,641	795	14,886	235	10	376	324	6,477	7,422	15,036	7,272	22,308
Red pine	9,538	887	424	10,849	124	13	169	70	3,873	4,249	10,801	4,297	15,098
White pine	3,525	42	99	3,666	40	0	26	4	1,408	1,478	3,637	1,507	5,144
Spruce	8,453	4,006	360	12,819	427	0	17	23	5,478	5,945	12,926	5,838	18,764
Tamarack	571	296	20	887	30	0	2	0	369	401	899	389	1,288
Total	43,361	13,671	2,113	59,145	1,347	83	832	498	23,779	26,539	59,792	25,892	85,684
HARDWOODS													
Ash	1,512	291	364	2,167	61	5	67	2	731	866	1,938	1,095	3,033
Aspen	92,952	37,033	7,906	137,891	1,902	75	4,028	63	51,743	57,811	136,053	59,649	195,702
Balsam poplar	2,573	979	198	3,750	31	0	121	0	1,469	1,621	3,704	1,667	5,371
Basswood	2,337	191	577	3,105	12	0	100	0	1,107	1,219	2,640	1,684	4,324
White birch	3,693	957	802	5,452	168	0	278	0	1,728	2,174	5,096	2,530	7,626
Yellow birch	48	3	11	62	0	0	0	0	23	23	51	34	85
Cottonwood	628	50	158	836	2	0	19	0	299	320	699	457	1,156
Elm	1,196	111	301	1,608	10	0	37	0	584	631	1,354	885	2,239
Hickory	20	2	3	25	0	0	0	0	9	9	22	12	34
Hard maple	270	43	62	375	10	0	9	0	118	137	332	180	512
Soft maple	540	378	114	1,032	70	18	26	6	210	330	1,038	324	1,362
Red oak	6,039	62	1,903	8,004	171	0	2,606	37	5,782	8,596	8,915	7,685	16,600
White oak	1,324	15	417	1,756	34	0	562	4	1,245	1,845	1,939	1,662	3,601
Walnut	120	7	32	159	0	0	2	0	54	56	129	86	215
Other hardwoods	81	7	16	104	0	0	0	0	37	37	88	53	141
Total	113,333	40,129	12,864	166,326	2,471	98	7,855	112	65,139	75,675	163,998	78,003	242,001
All species	156,694	53,800	14,977	225,471	3,818	181	8,687	610	88,918	102,214	223,790	103,895	327,685

Table 5.--Minnesota pulpwood production by species group, 1946-1988

(In thousand standard cords, unpeeled) 1/

Year	Roundwood									Residue	
	Total	Pine	Balsam fir	Hemlock	Spruce	Tamarack	Aspen	Birch	Other hardwoods	Soft-woods	Hard-woods
1946	977	333	93	--	258	19	265	1	0	3	5
1947	852	266	119	--	225	18	221	0	--	1	2
1948	988	286	150	--	269	5	276	2	0	--	--
1949	606	163	117	--	190	3	133	0	--	--	--
1950	748	187	126	--	185	1	248	0	1	--	--
1951	1,077	340	153	--	280	18	283	1	2	--	--
1952	937	194	163	--	293	13	270	2	2	--	--
1953	813	218	101	--	215	6	268	1	4	--	--
1954	837	214	118	--	237	7	254	1	6	--	--
1955	886	218	120	--	265	8	266	4	5	--	--
1956	1,067	259	140	--	287	14	353	5	9	--	--
1957	1,049	223	173	--	345	18	277	7	6	--	--
1958	903	198	116	--	241	14	324	2	8	--	--
1959	994	239	130	--	220	11	381	1	12	--	--
1960	1,048	225	145	--	256	19	392	1	10	--	--
1961	968	206	111	--	240	8	368	1	34	--	--
1962	979	201	110	--	217	9	406	2	34	--	--
1963	1,063	208	102	--	255	13	433	0	51	0	1
1964	1,063	204	90	--	256	12	451	0	45	0	5
1965	1,018	181	74	--	237	12	468	0	41	1	4
1966	1,174	256	80	--	172	7	612	1	31	2	13
1967	1,205	202	76	--	218	40	591	3	39	7	29
1968	1,087	203	43	--	157	26	583	1	22	16	36
1969	1,192	237	40	--	154	21	660	3	32	5	40
1970	1,224	221	45	--	181	36	600	31	27	17	66
1971	1,196	214	40	--	168	32	607	34	31	22	48
1972	1,354	216	66	--	192	31	689	42	30	25	63
1973	1,377	205	66	--	215	32	673	42	36	26	82
1974	1,578	239	92	--	207	43	804	44	37	35	77
1975	1,359	199	121	--	202	56	616	35	22	44	64
1976	1,309	172	74	--	176	37	673	46	32	33	66
1977	1,333	174	99	--	153	42	697	30	25	35	78
1978	1,338	186	96	--	164	31	704	9	39	35	74
1979 3/	1,458	158	117	--	153	36	838	7	31	43	75
1980	1,333	150	111	--	170	43	699	15	48	34	63
1981	1,370	147	101	--	127	30	801	11	53	39	61
1982	1,484	179	106	--	133	45	866	3	59	49	44
1983	1,910	140	90	--	95	26	1,392	4	69	55	39
1984	2,151	189	146	--	118	12	1,529	3	62	47	45
1985	1,880	137	122	--	111	9	1,361	2	48	47	43
1986	1,979	139	101	--	98	13	1,469	10	46	46	57
1987	2,078	111	112	--	101	8	1,578	13	41	54	60
1988	2,131	121	170	--	146	11	1,501	13	55	57	57

1/ 128 cubic feet consisting of 79 cubic feet of wood and 49 cubic feet of bark and air space.

2/ Less than 500 cords.

3/ Pulpwood includes logs, bolts, and wood residue used in manufacturing particleboard and waferboard after 1978.

Table 6.-- Minnesota pulpwood production by species group and destination, 1988

(In thousand standard cords, unpeeled) 1/

Class of material and species group	Total	Michigan	Minnesota	Wisconsin	Canada
ROUNDWOOD					
SOFTWOODS					
Balsam fir	170	--	166	--	5
Jack pine	93	--	83	7	3
Red pine	26	--	23	3	1
White pine	2	--	2	--	1
Spruce	146	--	106	30	9
Tamarack	11	--	10	1	--
Total	448	--	389	41	18
HARDWOODS					
Ash	2	--	1	1	--
Aspen	1,501	--	1,463	24	15
Balsam poplar	46	--	46	--	--
White birch	13	2	1	11	--
Soft maple	6	--	5	1	--
Total	1,569	2	1,516	37	15
Total roundwood	2,017	2	1,905	78	33
RESIDUES 3/					
Softwood	57	--	44	1	12
Hardwood	57	--	53	--	4
Total	114	--	98	1	16
ALL MATERIAL	2,131	2	2,003	78	48

1/ 128 cubic feet consisting of 79 cubic feet of wood and 49 cubic feet of bark and air space.

2/ Less than 500 cords.

3/ Chippable mill residues such as slabs, edgings, etc. Roundwood chips are included in roundwood.

Table 7.-- Pulpwood production by Forest Survey Unit, county, and species group, Minnesota, 1988

(In standard cords)

Unit and county	Balsam fir	Jack pine	Red pine	White pine	Spruce	Tama-rack	Ash	Aspen	Balsam poplar	White birch	Soft maple	All species
ASPEN-BIRCH UNIT												
Carlton	13,643	793	742	13	5,753	110	84	25,488	2,257	1,716	80	50,679
Cook	7,633	2,326	--	--	18,677	--	764	26,033	252	108	--	55,793
Koochiching	18,732	19,975	5,745	293	38,390	7,913	--	140,599	5,507	215	--	237,369
Lake	9,802	1,777	1,005	544	14,603	387	126	65,215	2,714	5,784	120	102,077
St. Louis	51,756	28,482	9,118	833	36,567	406	744	323,830	18,570	2,589	2,821	475,716
Total	101,566	53,353	16,610	1,683	113,990	8,816	1,718	581,165	29,300	10,412	3,021	921,634
NORTHERN PINE UNIT												
Aitkin	3,647	315	257	5	1,646	--	253	53,638	6,364	147	239	66,511
Becker	180	299	90	4	24	--	--	52,054	245	--	--	52,896
Beltrami	10,834	5,200	1,552	63	4,143	555	--	106,606	245	--	--	129,198
Cass	6,376	3,564	992	25	2,040	--	--	102,797	568	--	--	116,362
Clearwater	2,016	1,118	376	13	944	--	--	69,671	163	--	--	74,301
Crow Wing	--	3,338	471	--	24	--	--	36,347	217	--	--	40,397
Hubbard	457	3,020	895	39	537	--	--	68,989	245	--	--	74,182
Itasca	44,406	6,197	2,907	182	20,649	201	338	315,800	4,856	1,626	3,019	400,181
Lake of the Woods	71	9,057	648	--	1,284	1,141	--	2,227	--	--	--	14,428
Mahnomen	--	--	--	--	--	--	--	15,975	82	--	--	16,057
Roseau	--	6,155	--	--	187	--	--	11	--	--	--	6,353
Wadena	70	518	135	1	18	--	--	5,359	19	--	--	6,120
Total	68,057	38,781	8,323	332	31,496	1,897	591	829,474	13,004	1,773	3,258	996,986
CENTRAL HARDWOOD UNIT												
Isanti	24	--	--	--	--	--	--	--	--	--	--	24
Kanabec	--	--	--	--	--	--	--	1,659	--	--	--	1,659
Mille Lacs	152	42	23	--	69	--	--	37,179	31	--	--	37,496
Morrison	--	42	10	--	--	--	--	4,378	6	--	--	4,436
Pine	714	410	370	8	126	--	84	42,088	3,762	1,163	80	48,805
Sherburne	--	--	1,015	38	--	--	--	--	--	--	--	1,053
Todd	--	42	10	--	--	--	--	645	6	--	--	703
Total	890	536	1,428	46	195	--	84	85,949	3,805	1,163	80	94,176
PRAIRIE UNIT												
Polk	--	--	--	--	--	--	--	1,542	--	--	--	1,542
Red Lake	--	--	--	--	--	--	--	2,604	--	--	--	2,604
Total	--	--	--	--	--	--	--	4,146	--	--	--	4,146
STATE TOTAL	170,513	92,670	26,361	2,061	145,681	10,713	2,393	1,500,734	46,109	13,348	6,359	2,016,942

Table 8.--Pulpwood receipts in Minnesota by species group, 1946-1988

(In thousand standard cords, unpeeled) 1/

Year	Roundwood									Residue	
	Total	Pine	Balsam fir	Hemlock	Spruce	Tamarack	Aspen	Birch	Other hardwoods	Soft-woods	Hard-woods
1946	599	175	62	--	141	6	207	--	--	3	5
1947	497	160	48	--	122	6	158	--	--	1	2
1948	726	187	77	--	195	3	264	--	0	--	--
1949	418	111	48	--	114	1	144	--	--	--	--
1950	595	177	41	--	108	1	267	--	1	--	--
1951	823	241	74	--	202	9	296	--	1	--	--
1952	720	154	62	--	191	9	302	0	2	--	--
1953	662	165	42	--	153	6	292	0	4	--	--
1954	687	163	52	--	171	6	289	0	6	--	--
1955	723	177	58	--	176	7	298	2	5	--	--
1956	835	204	69	--	176	9	365	3	9	--	--
1957	753	156	74	--	210	10	292	5	6	--	--
1958	699	161	55	--	133	3	338	2	7	--	--
1959	813	195	69	--	128	3	405	1	12	--	--
1960	787	164	85	--	116	3	408	1	10	--	--
1961	784	187	67	--	120	--	375	1	34	--	--
1962	828	189	75	--	111	--	418	1	34	--	--
1963	921	190	77	--	157	--	446	0	50	0	1
1964	938	213	68	--	153	--	455	--	43	--	6
1965	912	205	60	--	138	0	462	0	39	--	8
1966	1063	207	60	--	155	0	588	1	31	--	21
1967	958	179	49	--	115	2	551	1	25	5	31
1968	993	206	33	--	92	0	576	0	27	13	46
1969	1082	231	33	--	84	0	633	3	40	7	51
1970	1058	188	42	--	111	--	557	31	33	22	74
1971	1063	154	40	--	116	0	585	34	38	32	64
1972	1224	166	65	--	128	4	686	41	36	23	75
1973	1223	156	60	--	142	7	618	41	38	51	110
1974	1392	193	84	--	142	10	718	37	40	73	95
1975	1227	169	116	--	163	32	560	33	21	51	82
1976	1177	134	68	--	142	7	599	43	31	62	91
1977	1210	143	94	--	125	16	624	27	24	55	102
1978	1218	151	90	--	136	10	647	3	31	60	90
1979 3/	1294	130	109	--	131	18	733	3	28	66	76
1980	1097	106	80	--	128	14	613	0	47	51	58
1981	1164	116	71	--	95	5	725	1	52	37	62
1982	1299	154	93	--	103	18	785	0	56	45	45
1983	1782	137	87	--	78	8	1,313	1	69	48	41
1984	1962	179	126	--	83	2	1,421	--	62	40	49
1985	1775	135	106	--	77	7	1,320	--	49	39	42
1986	1930	140	97	--	73	11	1,455	1	48	47	58
1987	2029	107	108	--	75	8	1,578	1	43	52	57
1988	2083	118	184	--	109	10	1,496	1	59	53	53

1/ 128 cubic feet consisting of 79 cubic feet of wood and 49 cubic feet of bark and air space.

2/ Less than 500 cords.

3/ Pulpwood includes logs, bolts, and wood residue used in manufacturing particleboard and waferboard after 1978.

Table 9.--Pulpwood receipts in Minnesota by area of origin, 1960-1988

(In thousand standard cords, unpeeled) 1/

Year	All areas	Area of Origin				
		Michigan	Wisconsin	Minnesota	Other states	Canada
1960	702	--	19	626	--	57
1961	793	--	14	721	--	58
1962	786	--	15	711	--	60
1963	805	--	20	712	--	73
1964	835	--	19	753	--	63
1965	898	--	8	828	1	61
1966	1,140	1	13	970	77	79
1967	958	--	15	884	1	58
1968	992	--	22	900	1	69
1969	1,082	--	17	977	2	86
1970	1,058	--	11	981	1	65
1971	1,064	--	35	992	1	36
1972	1,224	--	28	1,168	2	26
1973	1,222	--	14	1,152	29	27
1974	1,392	--	14	1,297	16	65
1975	1,226	--	20	1,173	18	15
1976	1,177	--	23	1,109	26	19
1977	1,209	--	26	1,149	19	15
1978	1,218	--	26	1,155	20	17
1979 3/	1,295	--	21	1,226	29	19
1980	1,097	--	18	1,044	20	15
1981	1,164	--	34	1,119	--	11
1982	1,298	--	26	1,264	--	8
1983	1,782	--	53	1,720	--	9
1984	1,961	--	65	1,888	--	8
1985	1,775	--	59	1,714	--	2
1986	1,930	--	56	1,873	--	1
1987	2,029	--	62	1,967	--	--
1988	2,083	--	80	2,002	--	1

1/ 128 cubic feet consisting of 79 cubic feet of wood and 49 cubic feet of bark and air space.

2/ Less than 500 cords.

3/ Pulpwood includes logs, bolts, and wood residue used in manufacturing particleboard and waferboard after 1978.

Table 10.-- Minnesota pulpwood receipts by species group and area of origin, 1988

(In thousand standard cords, unpeeled) 1/

Class of material and species group	Total	Minnesota	Wisconsin	Canada
ROUNDWOOD				
SOFTWOODS				
Cedar	--	--	--	--
Balsam fir	184	166	18	--
Jack pine	89	83	5	--
Red pine	27	23	5	--
White pine	2	2	--	--
Spruce	109	106	3	--
Tamarack	10	10	--	--
Total	420	389	31	--
HARDWOODS				
Ash	2	1	1	--
Aspen	1,497	1,463	33	1
Balsam poplar	48	46	2	--
White birch	1	1	--	--
Soft maple	9	5	3	--
Red oak	1	--	1	--
Total	1,558	1,516	40	1
All species	1,977	1,905	71	1
RESIDUES 3/				
Softwood	53	44	9	--
Hardwood	53	53	--	--
Total	106	98	9	0
ALL MATERIAL	2,083	2,003	80	1

1/ 128 cubic feet consisting of 79 cubic feet of wood and 49 cubic feet of bark and air space.

2/ Less than 500 cords.

3/ Chippable mill residues such as slabs, edgings, etc. Roundwood chips are included in roundwood.

Table 11.--Saw log production and receipts in Minnesota by species group, 1975 and 1988

(In thousand board feet) 1/

	Production			Receipts		
Species group	1975	1988	Change	1975	1988	Change
Softwoods						
Cedar	4,589	2,260	-2,329	4,588	2,260	-2,328
Balsam fir	2,100	4,186	2,086	1,927	3,895	1,968
Jack pine	29,058	34,950	5,892	28,474	38,385	9,911
Red pine	10,680	42,863	32,183	10,212	49,569	39,357
White pine	11,272	20,096	8,824	10,992	21,011	10,019
Spruce	3,145	7,470	4,325	3,046	5,584	2,538
Tamarack	79	253	174	79	253	174
Total	60,923	112,078	51,155	59,318	120,957	61,639
Hardwoods						
Ash	3,954	9,502	5,548	3,921	9,493	5,572
Aspen	49,501	82,496	32,995	49,398	82,530	33,132
Balsam poplar	1,269	450	-819	1,269	450	-819
Basswood	4,369	14,339	9,970	4,284	13,436	9,152
White birch	2,728	13,152	10,424	2,717	13,129	10,412
Yellow birch	0	304	304	0	341	341
Cottonwood	3,196	3,998	802	3,196	3,055	-141
Elm	9,508	8,120	-1,388	9,495	8,120	-1,375
Hickory	0	151	151	67	63	-4
Hard maple	934	1,630	696	896	1,578	682
Soft maple	781	2,383	1,602	668	2,192	1,524
Red oak	14,355	47,134	32,779	13,329	42,004	28,675
White oak	4,187	10,121	5,934	4,057	7,431	3,374
Walnut	236	736	500	131	682	551
Other hardwoods	182	561	379	104	547	443
Total	95,200	195,077	99,877	93,532	185,051	91,519
All species	156,123	307,155	151,032	152,850	306,008	153,158

1/ International 1/4-inch rule.

Table 12.--Saw log production by Forest Survey Unit, species group, and State of destination, Minnesota, 1988

(Thousand board feet) 1/

Species group	ALL UNITS				
	Total	Minnesota	Wisconsin	Iowa	Other States
SOFTWOODS					
Cedar	2,260	2,260	--	--	--
Balsam fir	4,186	3,883	--	--	303
Jack pine	34,950	32,938	--	--	2,012
Red pine	42,863	42,811	52	--	--
White pine	20,096	20,093	3	--	--
Spruce	7,470	5,584	--	--	1,886
Tamarack	253	253	--	--	--
Total	112,078	107,822	55	0	4,201
HARDWOODS					
Ash	9,502	9,289	213	--	--
Aspen	82,496	82,461	35	--	--
Balsam poplar	450	450	--	--	--
Basswood	14,339	13,160	409	770	--
White birch	13,152	13,129	23	--	--
Yellow birch	304	304	--	--	--
Cottonwood	3,998	2,880	42	1,076	--
Elm	8,120	7,945	175	--	--
Hickory	151	51	100	--	--
Hard maple	1,630	1,474	156	--	--
Soft maple	2,383	2,173	54	156	--
Red oak	47,134	39,762	5,192	2,180	--
White oak	10,121	7,202	1,761	1,158	--
Walnut	736	679	57	--	--
Other hardwoods	561	547	14	--	--
Total	195,077	181,506	8,231	5,340	0
All species	307,155	289,328	8,286	5,340	4,201

(Table 12 continued on next page)

(Table 12 continued)

ASPEN-BIRCH UNIT

Species group	Total	Minnesota	Wisconsin	Iowa	Other States
SOFTWOODS					
Cedar	1,330	1,330	--	--	--
Balsam fir	1,219	916	--	--	303
Jack pine	10,012	8,000	--	--	2,012
Red pine	14,755	14,720	35	--	--
White pine	10,578	10,578	--	--	--
Spruce	6,420	4,534	--	--	1,886
Tamarack	56	56	--	--	--
Total	44,370	40,134	35	0	4,201
HARDWOODS					
Ash	1,117	1,117	--	--	--
Aspen	29,803	29,803	--	--	--
Balsam poplar	22	22	--	--	--
Basswood	264	264	--	--	--
White birch	3,324	3,324	--	--	--
Yellow birch	3	3	--	--	--
Elm	60	60	--	--	--
Hard maple	55	55	--	--	--
Soft maple	33	33	--	--	--
Red oak	307	307	--	--	--
White oak	184	184	--	--	--
Walnut	--	--	--	--	--
Other hardwoods	--	--	--	--	--
Total	35,172	35,172	0	0	0
All species	79,542	75,306	35	0	4,201

NORTHERN PINE UNIT

SOFTWOODS					
Cedar	923	923	--	--	--
Balsam fir	2,867	2,867	--	--	--
Jack pine	24,552	24,552	--	--	--
Red pine	26,223	26,223	--	--	--
White pine	9,164	9,164	--	--	--
Spruce	1,050	1,050	--	--	--
Tamarack	161	161	--	--	--
Total	64,940	64,940	0	0	0
HARDWOODS					
Ash	5,095	5,095	--	--	--
Aspen	44,690	44,690	--	--	--
Balsam poplar	342	342	--	--	--
Basswood	5,728	5,728	--	--	--
White birch	9,219	9,219	--	--	--
Yellow birch	218	218	--	--	--
Cottonwood	154	154	--	--	--
Elm	2,496	2,496	--	--	--
Hard maple	285	285	--	--	--
Soft maple	313	313	--	--	--
Red oak	9,051	9,051	--	--	--
White oak	968	968	--	--	--
Walnut	68	68	--	--	--
Other hardwoods	81	81	--	--	--
Total	78,708	78,708	0	0	0
All species	143,648	143,648	0	0	0

(Table 12 continued on next page)

(Table 12 continued)

CENTRAL HARDWOOD UNIT

Species group	Total	Minnesota	Wisconsin	Iowa	Other States
SOFTWOODS					
Cedar	2	2	--	--	--
Balsam fir	100	100	--	--	--
Jack pine	379	379	--	--	--
Red pine	1,870	1,853	17	--	--
White pine	350	347	3	--	--
Tamarack	19	19	--	--	--
Total	2,720	2,700	20	0	0
HARDWOODS					
Ash	2,533	2,320	213	--	--
Aspen	7,660	7,625	35	--	--
Balsam poplar	85	85	0	--	--
Basswood	7,633	6,454	409	770	--
White birch	572	549	23	--	--
Yellow birch	75	75	--	--	--
Cottonwood	1,523	1,096	42	385	--
Elm	1,921	1,746	175	--	--
Hickory	149	49	100	--	--
Hard maple	1,233	1,077	156	--	--
Soft maple	1,744	1,534	54	156	--
Red oak	36,539	29,167	5,192	2,180	--
White oak	8,375	5,456	1,761	1,158	--
Walnut	371	314	57	--	--
Other hardwoods	395	381	14	--	--
Total	70,808	57,928	8,231	4,649	0
All species	73,528	60,628	8,251	4,649	0

PRAIRIE UNIT

SOFTWOODS					
Cedar	5	5	--	--	--
Jack pine	7	7	--	--	--
Red pine	15	15	--	--	--
White pine	4	4	--	--	--
Tamarack	17	17	--	--	--
Total	48	48	0	0	0
HARDWOODS					
Ash	757	757	--	--	--
Aspen	343	343	--	--	--
Balsam poplar	1	1	--	--	--
Basswood	714	714	--	--	--
White birch	37	37	--	--	--
Yellow birch	8	8	--	--	--
Cottonwood	2,321	1,630	--	691	--
Elm	3,643	3,643	--	--	--
Hickory	2	2	--	--	--
Hard maple	57	57	--	--	--
Soft maple	293	293	--	--	--
Red oak	1,237	1,237	--	--	--
White oak	594	594	--	--	--
Walnut	297	297	--	--	--
Other hardwoods	85	85	--	--	--
Total	10,389	9,698	0	691	0
All species	10,437	9,746	0	691	0

1/ International 1/4-inch rule.

Table 13.-- Saw log production by Forest Survey Unit, county, and species group, Minnesota, 1988

(In thousand board feet) 1/

Unit and county	Cedar	Balsam fir	Jack pine	Red pine	White pine	Spruce	Tamarack	Ash	Aspen	Balsam poplar	Basswood	White birch
ASPEN-BIRCH UNIT												
Carlton	--	116	281	491	203	--	5	263	384	--	192	438
Cook	266	344	2,511	360	445	4,014	--	12	2,516	--	--	916
Koochiching	729	466	1,381	1,912	705	736	1	483	20,840	20	61	110
Lake	16	12	716	2,782	3,631	785	--	39	675	--	--	1,042
St. Louis	319	281	5,123	9,210	5,594	885	50	320	5,388	2	11	818
Total	1,330	1,219	10,012	14,755	10,578	6,420	56	1,117	29,803	22	264	3,324
NORTHERN PINE UNIT												
Aitkin	1	70	256	392	186	5	16	1,342	6,338	5	1,518	380
Becker	--	--	1,279	1,280	1,319	26	--	329	2,233	--	518	234
Beltrami	623	38	4,046	3,032	888	129	21	869	6,050	142	629	1,982
Cass	75	1,134	6,093	8,197	1,921	269	--	269	5,349	80	271	1,516
Clearwater	--	--	1,340	1,004	619	14	8	317	2,755	6	198	140
Crow Wing	--	27	1,384	1,544	348	12	19	299	3,164	--	115	340
Hubbard	1	7	3,525	1,751	920	2	--	99	1,383	67	132	1,007
Itasca	187	1,514	4,142	8,399	2,862	456	--	1,406	15,513	39	2,304	3,602
Lake of the Woods	30	58	813	140	58	113	56	78	1,110	--	16	4
Mahnomen	--	--	177	27	--	--	--	45	577	3	27	12
Roseau	6	19	651	45	19	24	41	4	47	--	--	2
Wadena	--	--	846	412	24	--	--	38	171	--	--	--
Total	923	2,867	24,552	26,223	9,164	1,050	161	5,095	44,690	342	5,728	9,219
CENTRAL HARDWOOD UNIT												
Anoka	--	--	--	6	5	--	--	--	12	--	4	--
Benton	--	--	--	22	--	--	--	2	42	--	49	--
Carver	--	--	--	--	--	--	--	32	4	--	62	--
Chisago	--	--	--	4	1	--	--	67	1	--	73	--
Dakota	--	--	--	--	--	--	--	2	--	--	1	--
Douglas	--	--	--	6	--	--	--	61	10	--	84	10
Fillmore	--	--	--	1	--	--	--	71	103	--	403	--
Goodhue	--	--	--	--	--	--	--	44	50	--	591	--
Hennepin	--	--	--	--	--	--	--	--	29	--	4	--
Houston	--	--	--	--	--	--	--	139	247	--	935	--
Isanti	--	--	1	4	74	--	--	61	13	--	209	--
Kanabec	--	10	10	83	15	--	--	111	996	4	374	82
Le Sueur	--	--	--	--	--	--	--	--	--	--	1	--
Mille Lacs	--	--	--	4	1	--	--	162	3,103	--	956	7
Morrison	--	--	67	137	27	--	--	105	1,234	--	316	2
Olmstead	--	--	--	--	--	--	--	29	11	--	102	--
Otter Tail	--	--	--	6	41	--	12	186	146	--	332	10
Pine	--	90	286	1,497	160	--	4	449	1,119	81	344	437
Rice	2	--	--	--	--	--	--	122	38	--	410	--
Scott	--	--	--	--	--	--	--	10	13	--	132	--
Sherburne	--	--	--	2	3	--	--	--	14	--	21	--
Stearns	--	--	--	67	16	--	--	186	4	--	278	--
Todd	--	--	15	28	2	--	3	201	290	--	570	1
Wabasha	--	--	--	0	3	--	--	294	100	--	691	23
Washington	--	--	--	1	1	--	--	111	7	--	117	--
Winona	--	--	--	2	--	--	--	83	60	--	552	--
Wright	--	--	--	--	1	--	--	5	14	--	22	--
Total	2	100	379	1,870	350	0	19	2,533	7,660	85	7,633	572

(Table 13 continued on next page)

(Table 13 continued)

PRAIRIE UNIT

Unit and county	Cedar	Balsam fir	Jack pine	Red pine	White pine	Spruce	Tamarack	Ash	Aspen	Balsam poplar	Basswood	White birch
Blue Earth	--	--	--	--	--	--	--	5	--	--	7	--
Brown	--	--	--	--	--	--	--	24	--	--	24	--
Chippewa	--	--	--	--	--	--	--	12	--	--	--	--
Clay	--	--	2	2	--	--	--	43	22	--	18	20
Dodge	--	--	--	--	--	--	--	15	--	--	22	--
Faribault	--	--	--	--	--	--	--	56	--	--	--	--
Freeborn	--	--	--	--	--	--	--	--	--	--	--	--
Grant	--	--	--	--	--	--	--	--	--	--	--	--
Jackson	--	--	--	--	--	--	--	1	--	--	--	--
Kandiyohi	--	--	--	--	--	--	--	51	--	--	188	--
Kittson	--	--	--	--	--	--	--	--	--	--	--	--
Lac Qui Parle	--	--	--	--	--	--	--	--	--	--	--	--
Lincoln	--	--	--	--	--	--	--	17	--	--	--	--
Lyon	--	--	--	--	--	--	--	13	--	--	--	--
Mcleod	--	--	--	--	--	--	--	38	10	--	12	--
Marshall	--	--	4	--	--	--	9	1	15	--	--	1
Meeker	--	--	--	--	--	--	--	53	2	--	30	--
Mower	--	--	--	3	--	--	--	--	--	--	--	--
Murray	--	--	--	--	--	--	--	--	--	--	--	--
Nicollet	--	--	--	--	--	--	--	34	--	--	40	--
Nobles	--	--	--	--	--	--	--	4	--	--	--	--
Norman	--	--	--	--	--	--	--	38	15	--	15	15
Pipestone	--	--	--	8	--	--	--	11	--	--	--	--
Polk	5	--	1	2	1	--	8	59	203	1	7	1
Pope	--	--	--	--	--	--	--	29	2	--	53	--
Red Lake	--	--	--	--	--	--	--	2	67	--	--	--
Redwood	--	--	--	--	--	--	--	105	--	--	111	--
Renville	--	--	--	--	3	--	--	75	--	--	80	--
Sibley	--	--	--	--	--	--	--	--	7	--	96	--
Steele	--	--	--	--	--	--	--	--	--	--	--	--
Stevens	--	--	--	--	--	--	--	1	--	--	--	--
Swift	--	--	--	--	--	--	--	--	--	--	--	--
Waseca	--	--	--	--	--	--	--	60	--	--	--	--
Yellow Medicine	--	--	--	--	--	--	--	10	--	--	11	--
Total	5	0	7	15	4	0	17	757	343	1	714	37
STATE TOTAL	2,260	4,186	34,950	42,863	20,096	7,470	253	9,502	82,496	450	14,339	13,152

(Table 13 continued on next page)

(Table 13 continued)

Unit and county	Yellow birch	Cotton-wood	Elm	Hickory	Hard maple	Soft maple	Red oak	White oak	Walnut	O. hard-woods	All species
ASPEN-BIRCH UNIT											
Carlton	--	--	32	--	55	32	234	134	--	--	2,860
Cook	--	--	--	--	--	--	--	--	--	--	11,384
Koochiching	--	--	28	--	--	1	33	50	--	--	27,556
Lake	--	--	--	--	--	--	--	--	--	--	9,698
St. Louis	3	--	--	--	--	--	40	--	--	--	28,044
Total	3	0	60	0	55	33	307	184	0	0	79,542
NORTHERN PINE UNIT											
Aitkin	--	38	53	--	204	36	3,049	145	52	11	14,097
Becker	28	2	112	--	20	90	1,430	343	--	57	9,300
Beltrami	60	--	1,320	--	3	90	400	103	3	--	20,428
Cass	28	--	60	--	1	34	703	62	--	13	26,075
Clearwater	87	4	426	--	12	21	630	79	--	--	7,660
Crow Wing	--	97	8	--	43	32	1,692	193	13	--	9,330
Hubbard	--	--	64	--	2	2	164	6	--	--	9,132
Itasca	--	--	195	--	--	1	784	--	--	--	41,404
Lake of the Woods	15	--	35	--	--	7	3	--	--	--	2,536
Mahnomen	--	--	204	--	--	--	177	37	--	--	1,286
Roseau	--	13	17	--	--	--	1	--	--	--	889
Wadena	--	--	2	--	--	--	18	--	--	--	1,511
Total	218	154	2,496	0	285	313	9,051	968	68	81	143,648
CENTRAL HARDWOOD UNIT											
Anoka	--	--	12	--	--	--	107	16	1	1	164
Benton	--	--	18	--	--	--	51	3	--	--	187
Carver	--	55	15	--	7	19	96	92	35	11	428
Chisago	--	--	1	--	--	41	341	145	0	26	700
Dakota	--	30	21	--	2	6	38	24	1	--	125
Douglas	--	10	25	--	10	10	500	135	10	--	871
Fillmore	--	95	178	17	51	49	3,246	658	22	3	4,897
Goodhue	--	235	190	2	135	107	1,886	591	41	4	3,876
Hennepin	--	2	13	--	--	6	14	4	--	--	72
Houston	--	191	238	62	258	59	9,488	1,804	31	58	13,510
Isanti	--	38	2	--	20	35	278	64	--	22	821
Kanabec	--	38	5	--	44	417	1,079	137	--	17	3,422
Le Sueur	--	6	7	--	1	--	5	1	--	--	21
Mille Lacs	--	94	26	--	51	--	1,503	118	--	--	6,025
Morrison	--	51	35	--	14	--	691	92	--	--	2,771
Olmstead	--	42	51	1	25	25	717	140	4	8	1,155
Otter Tail	57	8	82	--	2	26	812	229	--	13	1,962
Pine	--	18	75	--	268	334	1,473	464	--	13	7,112
Rice	--	74	102	2	25	108	865	294	180	49	2,271
Scott	--	111	31	--	14	14	123	102	--	--	550
Sherburne	--	--	22	--	--	--	122	1	--	--	185
Stearns	--	45	110	--	11	63	552	146	7	40	1,525
Todd	18	95	43	--	48	--	1,280	381	--	--	2,975
Wabasha	--	185	384	17	164	280	5,669	1,064	11	17	8,902
Washington	--	--	9	--	--	76	169	128	0	49	668
Winona	--	90	180	48	83	54	5,312	1,542	28	64	8,098
Wright	--	10	46	--	--	15	122	--	--	--	235
Total	75	1,523	1,921	149	1,233	1,744	36,539	8,375	371	395	73,528

(Table 13 continued on next page)

(Table 13 continued)

PRAIRIE UNIT

Unit and county	Yellow birch	Cotton-wood	Elm	Hickory	Hard maple	Soft maple	Red oak	White oak	Walnut	O. hard-woods	All species
Blue Earth	--	142	8	--	--	6	9	9	27	1	214
Brown	--	384	0	--	--	48	--	--	--	--	480
Chippewa	--	3	4	--	--	--	6	--	--	--	25
Clay	--	5	817	--	--	--	88	17	--	--	1,034
Dodge	--	2	16	--	15	15	212	15	--	--	312
Faribault	--	92	12	--	--	--	40	3	8	--	211
Freeborn	--	24	6	--	--	--	12	18	--	--	60
Grant	--	1	2	--	--	--	--	--	--	--	3
Jackson	--	6	0	--	--	1	1	--	1	--	10
Kandiyohi	--	56	9	--	26	6	213	56	6	4	615
Kittson	--	0	432	--	--	--	--	--	--	--	432
Lac Qui Parle	--	3	2	--	--	--	--	--	--	--	5
Lincoln	--	90	6	--	--	--	--	--	--	--	113
Lyon	--	79	11	--	--	--	--	--	--	--	103
Mcleod	--	20	18	--	--	--	5	35	--	--	138
Marshall	--	5	436	--	--	--	--	--	--	--	471
Meeker	--	25	27	--	6	--	33	41	6	--	223
Mower	--	11	4	--	--	--	30	49	--	--	97
Murray	--	592	10	--	--	--	--	--	--	--	602
Nicollet	--	533	5	--	--	66	7	4	23	1	713
Nobles	--	22	2	--	--	4	4	--	4	--	40
Norman	--	--	695	--	--	--	77	19	--	--	874
Pipestone	--	--	40	2	--	--	8	--	--	--	69
Polk	8	66	811	--	--	4	61	18	--	--	1,256
Pope	--	8	39	--	6	--	29	63	6	--	235
Red Lake	--	0	173	--	--	--	27	2	--	--	271
Redwood	--	96	--	--	--	80	144	112	122	43	813
Renville	--	--	--	--	--	52	108	84	90	32	524
Sibley	--	26	36	--	4	5	58	16	--	--	248
Steele	--	6	2	--	--	--	7	16	1	--	32
Stevens	--	4	4	--	--	--	1	--	--	--	10
Swift	--	--	1	--	--	--	--	2	--	--	3
Waseca	--	20	15	--	--	--	43	3	3	--	144
Yellow Medicine	--	--	--	--	--	6	14	12	--	4	57
Total	8	2,321	3,643	2	57	293	1,237	594	297	85	10,437
STATE TOTAL	304	3,998	8,120	151	1,630	2,383	47,134	10,121	736	561	307,155

1/ International 1/4-inch rule.

Table 14.--Saw log receipts in Minnesota by Forest Survey Unit, species group, and State of origin, 1988

(In thousand board feet) 1/

	ALL UNITS				
Species group	Total	Minnesota	Wisconsin	Iowa	Other
SOFTWOODS					
Cedar	2,260	2,260	--	--	--
Balsam fir	3,895	3,883	12	--	--
Jack pine	38,385	32,938	5,447	--	--
Red pine	49,569	42,811	6,758	--	--
White pine	21,011	20,093	918	--	--
Spruce	5,584	5,584	--	--	--
Tamarack	253	253	--	--	--
Total	120,957	107,822	13,135	0	0
HARDWOODS					
Ash	9,493	9,289	--	17	187
Aspen	82,530	82,461	12	38	19
Balsam poplar	450	450	--	--	--
Basswood	13,436	13,160	--	238	38
Paper birch	13,129	13,129	--	--	--
Yellow birch	341	304	--	--	37
Cottonwood	3,055	2,880	--	175	--
Elm	8,120	7,945	--	100	75
Hickory	63	51	--	12	--
Hard maple	1,578	1,474	--	104	--
Soft maple	2,192	2,173	--	--	19
Red oak	42,003	39,762	1	2,241	--
White oak	7,431	7,202	--	229	--
Walnut	682	679	--	3	--
Other hardwoods	547	547	--	--	--
Total	185,050	181,506	13	3,157	375
All species	306,008	289,328	13,148	3,157	375

(Table 14 continued on next page)

(Table 14 continued)

Species group	Total	Minnesota	Wisconsin	Iowa	Other
ASPEN-BIRCH UNIT					
SOFTWOODS					
Cedar	1,019	1,019	--	--	--
Balsam fir	464	452	12	--	--
Jack pine	24,701	19,254	5,447	--	--
Red pine	26,334	19,576	6,758	--	--
White pine	11,116	10,198	918	--	--
Spruce	4,686	4,686	0	--	--
Tamarack	55	55	0	--	--
Total	68,375	55,240	13,135	0	0
HARDWOODS					
Ash	904	904	--	--	--
Aspen	18,791	18,791	--	--	--
Balsam poplar	8	8	--	--	--
Basswood	14	14	--	--	--
Paper birch	4,268	4,268	--	--	--
Yellow birch	3	3	--	--	--
Hard maple	23	23	--	--	--
Red oak	52	52	--	--	--
White oak	50	50	--	--	--
Total	24,113	24,113	0	0	0
All species	92,488	79,353	13,135	0	0
NORTHERN PINE UNIT					
SOFTWOODS					
Cedar	1,234	1,234	--	--	--
Balsam fir	3,208	3,208	--	--	--
Jack pine	13,242	13,242	--	--	--
Red pine	21,030	21,030	--	--	--
White pine	9,480	9,480	--	--	--
Spruce	898	898	--	--	--
Tamarack	132	132	--	--	--
Total	49,224	49,224	0	0	0
HARDWOODS					
Ash	5,277	5,090	--	--	187
Aspen	54,081	54,062	--	--	19
Balsam poplar	352	352	--	--	--
Basswood	5,496	5,458	--	--	38
Paper birch	7,917	7,917	--	--	--
Yellow birch	338	301	--	--	37
Elm	5,369	5,294	--	--	75
Hard maple	247	247	--	--	--
Soft maple	190	171	--	--	19
Red oak	8,941	8,941	--	--	--
White oak	960	960	--	--	--
Walnut	66	66	--	--	--
Other hardwoods	3	3	--	--	--
Total	89,237	88,862	0	0	375
All species	138,461	138,086	0	0	375

(Table 14 continued on next page)

(Table 14 continued)

Species group	Total	Minnesota	Wisconsin	Iowa	Other
CENTRAL HARDWOOD UNIT					
SOFTWOODS					
Cedar	2	2	--	--	--
Balsam fir	223	223	--	--	--
Jack pine	439	439	--	--	--
Red pine	2,197	2,197	--	--	--
White pine	412	412	--	--	--
Tamarack	19	19	--	--	--
Total	3,292	3,292	0	0	0
HARDWOODS					
Ash	1,965	1,948	--	17	--
Aspen	9,548	9,498	12	38	--
Balsam poplar	90	90	--	--	--
Basswood	6,312	6,074	--	238	--
Paper birch	936	936	--	--	--
Cottonwood	1,248	1,238	--	10	--
Elm	1,880	1,780	--	100	--
Hickory	61	49	--	12	--
Hard maple	1,273	1,169	--	104	--
Soft maple	1,220	1,220	--	--	--
Red oak	30,874	28,635	1	2,238	--
White oak	4,929	4,719	--	210	--
Walnut	100	97	--	3	--
Other hardwoods	140	140	--	--	--
Total	60,576	57,593	13	2,970	0
All species	63,868	60,885	13	2,970	0
PRAIRIE UNIT					
SOFTWOODS					
Cedar	5	5	--	--	--
Jack pine	3	3	--	--	--
Red pine	8	8	--	--	--
White pine	3	3	--	--	--
Tamarack	47	47	--	--	--
Total	66	66	0	0	0
HARDWOODS					
Ash	1,347	1,347	--	--	--
Aspen	110	110	--	--	--
Basswood	1,614	1,614	--	--	--
Paper birch	8	8	--	--	--
Cottonwood	1,807	1,642	--	165	--
Elm	871	871	--	--	--
Hickory	2	2	--	--	--
Hard maple	35	35	--	--	--
Soft maple	782	782	--	--	--
Red oak	2,137	2,134	--	3	--
White oak	1,492	1,473	--	19	--
Walnut	516	516	--	--	--
Other hardwoods	404	404	--	--	--
Total	11,125	10,938	0	187	0
All species	11,191	11,004	0	187	0

1/ International 1/4-inch rule.

Table 15.--Veneer log production and receipts in Minnesota for selected years, 1960-1988

(In thousand board feet) 1/

Year	Production	Receipts 2/
1960	10.2	1.1
1963	9.9	3.1
1965	8.5	1.1
1966	6.0	0.5
1968	5.2	0.5
1970	3.5	0.3
1972	4.2	0.4
1975	3.2	0.6
1980	6.5	3.5
1984	5.7	3.0
1988	14.5	11.6

1/ International 1/4-inch rule.

2/ Receipts prior to 1988 excluded Diamond Match to avoid disclosure.

Table 16.--Veneer log production and receipts by species group in Minnesota, 1975 and 1988

(In thousand board feet) 1/

	Production			Receipts		
Species group	1975	1988	Change	1975 2/	1988	Change
SOFTWOODS						
White pine	0	14	14	--	--	--
Total	0	14	14	--	--	--
HARDWOOS						
Ash	17	498	481	--	--	--
Aspen	443	3,796	3,353	36	3,666	3,630
Basswood	417	1,769	1,352	190	73	-117
White birch	190	7,896	7,706	--	7,800	7,800
Yellow birch	20	37	17	--	--	--
Cottonwood	358	348	-10	36	5	-31
Elm	376	143	-233	31	0	-31
Hard maple	290	62	-228	5	0	-5
Soft maple	168	364	196	220	42	-178
Red oak	751	989	238	78	0	-78
White oak	29	158	129	--	--	--
Walnut	151	99	-52	--	--	--
Other hardwoods	6	0	-6	--	--	--
Total	3,216	16,159	12,943	596	11,586	10,990
All species	3,216	16,173	12,957	596	11,586	10,990

1/ International 1/4-inch rule.

2/ Receipts for Diamond Match not included to avoid disclosure.

Table 17.-- Veneer log and bolt production in Minnesota by species and State of destination, 1988

(In thousand board feet) 1/

Species	Total	Destination		
		Minnesota	Wisconsin	Other
SOFTWOODS				
White pine	14	--	14	--
Total	14	--	14	--
HARDWOODS				
Ash	498	--	6	492
Aspen	3,796	3,666	93	37
Basswood	1,769	73	1,423	273
White birch	7,896	7,800	3	93
Yellow birch	37	--	--	37
Cottonwood	348	5	343	--
Elm	143	--	--	143
Hard maple	62	--	--	62
Soft maple	364	42	322	--
Red oak	989	--	714	275
White oak	158	--	11	147
Walnut	99	--	--	99
Total	16,159	11,586	2,915	1,658
All species	16,173	11,586	2,929	1,658

1/ International 1/4-inch rule.

Table 18.--Veneer log receipts in Minnesota by area of origin for selected years, 1960-1988

(In thousand board feet) 1/

Year	All areas	Area of origin				
		Michigan	Wisconsin	Minnesota	Other States	2/ Canada
1960	1.1	--	--	1.1	--	--
1963	3.1	--	--	3.0	--	0.1
1965	1.1	--	--	1.1	--	--
1966	0.5	--	--	0.5	--	--
1968	0.5	--	--	0.5	--	--
1970	0.3	--	--	0.3	--	--
1972	0.4	--	--	0.4	--	--
1975	0.6	--	--	0.6	--	--
1980	3.5	--	--	3.5	--	--
1984	3.0	--	--	3.0	--	--
1988	11.6	--	--	11.6	--	--

1/ International 1/4-inch rule.

2/ Includes only logs and bolts shipped to Canadian mills for processing.

3/ Includes nominal quantities from other countries.

4/ Includes all veneer logs received at Iron Wood Products Co.; such receipts are not shown before 1974.

Table 19.-- Veneer log and bolt receipts in Minnesota by species group and area of origin, 1988

(In thousand board feet) 1/

Species group	Total	Minnesota
Ash		
Aspen	3,666	3,666
Basswood	73	73
White birch	7,800	7,800
Basswood	73	73
Cottonwood	5	5
Soft maple	42	42
All species	11,586	11,586

1/ International 1/4-inch rule.

Table 20.-- Growing-stock removals from timberland for industrial roundwood by Forest Survey Unit, county, and species group, Minnesota, 1988

(In thousand cubic feet)

Unit and county	Cedar	Balsam fir	Jack pine	Red pine	White pine	Spruce	Tamarack	Ash	Aspen	Balsam poplar	Basswood	White birch
ASPEN-BIRCH UNIT												
Carlton	--	1,077	118	140	36	443	9	62	2,109	179	37	253
Cook	55	661	700	63	77	2,289	--	50	2,609	21	--	332
Koochiching	274	1,545	1,794	1,003	144	3,118	611	111	15,579	442	12	50
Lake	3	759	283	561	673	1,293	30	22	5,360	216	--	1,355
St. Louis	113	4,056	3,180	2,311	1,036	3,010	42	124	26,860	1,476	2	1,078
Total	445	8,098	6,075	4,078	1,966	10,153	692	369	52,517	2,334	51	3,068
NORTHERN PINE UNIT												
Aitkin	--	295	79	105	33	128	13	300	5,372	507	296	97
Becker	--	14	292	230	230	8	--	65	4,661	19	101	71
Beltrami	1,433	847	1,321	703	165	349	47	176	9,636	46	123	415
Cass	39	732	1,665	1,502	336	213	--	63	10,082	61	52	328
Clearwater	--	156	370	206	109	75	1	62	6,095	14	39	27
Crow Wing	--	6	582	326	61	4	3	58	3,811	18	23	77
Hubbard	--	36	1,003	386	164	42	--	21	5,792	33	26	225
Itasca	40	3,748	1,392	2,512	514	1,691	15	321	28,056	393	450	888
Lake of theWoods	6	17	839	74	10	122	100	15	390	--	2	1
Mahnomen	--	--	38	5	--	--	--	8	1,381	6	6	2
Roseau	1	3	591	8	3	18	9	1	10	--	--	--
Wadena	--	5	471	125	4	1	--	9	458	1	--	2
Total	1,519	5,859	8,643	6,182	1,629	2,651	188	1,099	75,744	1,098	1,118	2,133
CENTRAL HARDWOOD UNIT												
Anoka	--	--	--	1	1	--	--	--	3	--	1	--
Benton	--	--	--	4	--	--	--	--	7	--	9	--
Carver	--	--	--	--	--	--	--	7	1	--	12	--
Chisago	--	--	--	14	--	--	--	14	2	--	29	--
Dakota	--	--	--	--	--	--	--	--	--	--	--	--
Douglas	--	--	--	1	--	--	--	12	2	--	16	1
Fillmore	--	--	--	--	--	--	--	15	20	--	80	--
Goodhue	--	--	--	--	--	--	--	8	11	--	134	--
Hennepin	--	--	--	--	--	--	--	--	6	--	1	--
Houston	--	--	--	--	--	--	--	46	52	--	244	--
Isanti	--	2	--	20	13	--	--	12	5	--	52	--
Kanabec	--	2	2	20	3	--	--	22	708	1	102	18
Le Sueur	--	--	--	--	--	--	--	--	--	--	--	--
Mille Lacs	--	11	3	2	--	5	--	49	3,526	3	199	11
Morrison	--	--	43	47	6	--	--	20	915	--	62	4
Olmstead	--	--	--	--	--	--	--	6	2	--	20	--
Otter Tail	--	--	--	1	7	--	2	36	81	--	65	1
Pine	27	74	91	304	30	9	1	104	3,565	314	146	205
Rice	--	--	--	--	--	--	--	24	7	--	80	--
Scott	--	--	--	--	--	--	--	1	3	--	27	--
Sherburne	--	--	2	156	6	1	--	--	3	--	4	--
Stearns	--	--	--	11	3	--	--	36	1	--	54	--
Todd	--	--	26	6	--	--	1	39	273	--	111	--
Wabasha	--	--	--	--	1	--	--	59	22	--	156	5
Washington	--	--	--	--	--	--	--	22	1	--	23	--
Winona	--	--	--	--	--	--	--	20	16	--	146	--
Wright	--	--	--	--	--	--	--	1	3	--	5	--
Total	27	89	167	587	70	15	4	553	9,235	318	1,778	245

(Table 20 continued on next page)

(Table 20 continued)

PRAIRIE UNIT

Unit and county	Cedar	Balsam fir	Jack pine	Red pine	White pine	Spruce	Tamarack	Ash	Aspen	Balsam poplar	Basswood	White birch
Blue Earth	--	--	--	--	--	--	--	1	--	--	1	--
Brown	--	--	--	--	--	--	--	5	--	--	5	--
Chippewa	--	--	--	--	--	--	--	2	--	--	--	--
Clay	--	--	--	--	--	--	--	8	4	--	3	4
Dodge	--	--	--	--	--	--	--	2	--	--	5	--
Faribault	--	--	--	--	--	--	--	11	--	--	--	--
Freeborn	--	--	--	--	--	--	--	--	--	--	--	--
Grant	--	--	--	--	--	--	--	--	--	--	--	--
Jackson	--	--	--	--	--	--	--	--	--	--	--	--
Kandiyohi	--	--	--	--	--	--	--	9	--	--	36	--
Kittson	--	--	--	--	--	--	--	--	--	--	--	--
Lac Qui Parle	--	--	--	--	--	--	--	--	--	--	--	--
Lincoln	--	--	--	--	--	--	--	2	--	--	--	--
Lyon	--	--	--	--	--	--	--	2	--	--	--	--
Mcleod	--	--	--	--	--	--	--	7	2	--	2	--
Marshall	--	--	--	--	--	--	2	--	3	--	--	--
Meeker	--	--	--	--	--	--	--	10	--	--	6	--
Mower	--	--	--	--	--	--	--	--	--	--	--	--
Murray	--	--	--	--	--	--	--	--	--	--	--	--
Nicollet	--	--	--	--	--	--	--	7	--	--	8	--
Nobles	--	--	--	--	--	--	--	1	--	--	--	--
Norman	--	--	--	--	--	--	--	7	3	--	2	2
Pipestone	--	--	--	1	--	--	--	2	--	--	--	--
Polk	1	--	--	--	--	--	1	12	161	--	1	--
Pope	--	--	--	--	--	--	--	6	--	--	10	--
Red Lake	--	--	--	--	--	--	--	--	221	--	--	--
Redwood	--	--	--	--	--	--	--	20	--	--	22	--
Renville	--	--	--	--	1	--	--	15	--	--	16	--
Sibley	--	--	--	--	--	--	--	4	1	--	39	--
Steele	--	--	--	--	--	--	--	--	--	--	--	--
Stevens	--	--	--	--	--	--	--	--	--	--	--	--
Swift	--	--	--	--	--	--	--	--	--	--	--	--
Waseca	--	--	--	--	--	--	--	12	--	--	--	--
Yellow Medicine	--	--	--	--	--	--	--	1	--	--	2	--
Total	1	0	0	1	1	0	3	146	395	0	158	6
STATE TOTAL	1,992	14,046	14,885	10,848	3,666	12,819	887	2,167	137,891	3,750	3,105	5,452

(Table 20 continued on next page)

(Table 20 continued)

Unit and county	Yellow birch	Cotton-wood	Elm	Hickory	Hard maple	Soft maple	Red oak	White oak	Walnut	O. hard-woods	All species
ASPEN-BIRCH UNIT											
Carlton	--	--	7	--	11	15	40	22	--	--	4,558
Cook	--	--	--	--	--	2	--	--	--	--	6,859
Koochiching	--	--	8	--	--	2	5	8	--	--	24,706
Lake	--	--	--	--	4	11	--	--	--	--	10,570
St. Louis	--	--	2	--	11	222	18	--	--	--	43,541
Total	0	0	17	0	26	252	63	30	0	0	90,234
NORTHERN PINE UNIT											
Aitkin	1	7	14	--	45	30	507	28	10	2	7,869
Becker	6	--	22	--	11	26	237	57	--	11	6,061
Beltrami	12	--	260	--	2	17	67	21	--	--	15,640
Cass	6	--	16	--	4	7	124	14	--	2	15,246
Clearwater	17	1	84	--	2	4	105	13	--	--	7,380
Crow Wing	--	19	1	--	10	9	284	32	2	--	5,326
Hubbard	--	--	12	--	7	9	30	1	--	--	7,787
Itasca	--	--	40	--	4	199	132	--	--	--	40,395
Lake of theWoods	2	--	7	--	--	1	--	--	--	--	1,586
Mahnomen	--	--	40	--	--	--	29	6	--	--	1,521
Roseau	--	2	2	--	--	--	--	--	--	--	648
Wadena	--	--	--	--	--	--	3	--	--	--	1,079
Total	44	29	498	0	85	302	1,518	172	12	15	110,538
CENTRAL HARDWOOD UNIT											
Anoka	--	--	2	--	--	--	17	3	--	--	28
Benton	--	--	3	--	--	--	8	--	--	--	31
Carver	--	11	2	--	1	4	16	15	7	2	78
Chisago	--	--	--	--	--	8	58	24	--	6	155
Dakota	--	11	4	--	--	1	6	4	--	--	26
Douglas	--	1	6	--	1	1	83	22	1	--	147
Fillmore	--	19	38	2	11	9	549	113	9	--	865
Goodhue	--	53	37	--	26	20	313	98	8	1	709
Hennepin	--	0	2	--	--	1	3	--	--	--	13
Houston	--	56	47	12	52	40	1,625	348	11	11	2,544
Isanti	--	7	--	--	4	7	47	11	--	5	185
Kanabec	--	7	1	--	9	82	184	22	--	2	1,185
Le Sueur	--	1	1	--	--	--	1	--	--	--	3
Mille Lacs	1	20	7	--	10	2	249	20	--	--	4,118
Morrison	--	9	7	--	3	2	114	15	--	--	1,247
Olmstead	--	8	9	--	6	6	121	23	1	1	203
Otter Tail	11	1	16	--	--	6	134	38	--	2	401
Pine	2	3	16	--	59	80	260	81	--	2	5,373
Rice	--	15	21	--	6	22	143	49	35	9	411
Scott	--	27	6	--	2	6	20	17	--	--	109
Sherburne	--	--	5	--	--	--	20	--	--	--	197
Stearns	--	8	22	--	2	12	92	24	1	8	274
Todd	3	19	8	--	9	--	218	68	--	--	781
Wabasha	--	43	78	2	34	68	962	181	6	2	1,619
Washington	--	--	1	--	--	15	28	21	0	9	120
Winona	--	34	36	9	18	23	927	262	11	12	1,514
Wright	--	1	9	--	--	2	20	--	--	--	41
Total	17	354	384	25	253	417	6,218	1,459	90	72	22,377

(Table 20 continued on next page)

(Table 20 continued)

PRAIRIE UNIT

Unit and county	Yellow birch	Cotton-wood	Elm	Hickory	Hard maple	Soft maple	Red oak	White oak	Walnut	O. hard-woods	All species
Blue Earth	--	28	1	--	--	1	1	1	6	--	40
Brown	--	74	--	--	--	9	--	--	--	--	93
Chippewa	--	--	1	--	--	--	1	--	--	--	4
Clay	--	1	159	--	--	--	14	3	--	--	196
Dodge	--	--	2	--	2	2	34	3	--	--	50
Faribault	--	18	2	--	--	--	7	--	1	--	39
Freeborn	--	5	1	--	--	--	1	3	--	--	10
Grant	--	--	--	--	--	--	--	--	--	--	--
Jackson	--	1	--	--	--	--	--	--	--	--	1
Kandiyohi	--	11	1	--	6	1	35	9	1	1	110
Kittson	--	--	84	--	--	--	--	--	--	--	84
Lac Qui Parle	--	--	--	--	--	--	--	--	--	--	--
Lincoln	--	17	1	--	--	--	--	--	--	--	20
Lyon	--	15	2	--	--	--	--	--	--	--	19
Mcleod	--	4	3	--	--	--	1	5	--	--	24
Marshall	--	1	85	--	--	--	--	--	--	--	92
Meeker	--	6	6	--	1	--	5	7	1	--	42
Mower	--	2	1	--	--	--	5	8	--	--	17
Murray	--	115	1	--	--	--	--	--	--	--	116
Nicollet	--	104	1	--	--	14	1	--	5	--	140
Nobles	--	5	--	--	--	1	--	--	1	--	8
Norman	--	--	135	--	--	--	13	3	--	--	165
Pipestone	--	--	8	--	--	--	1	--	--	--	12
Polk	1	14	158	--	--	1	10	3	--	--	363
Pope	--	1	8	--	1	--	5	10	1	--	42
Red Lake	--	--	34	--	--	--	4	--	--	--	259
Redwood	--	19	--	--	--	16	24	18	24	8	151
Renville	--	--	--	--	--	10	17	13	17	7	96
Sibley	--	6	12	--	1	5	15	5	--	--	88
Steele	--	1	--	--	--	--	1	3	--	--	5
Stevens	--	1	1	--	--	--	--	--	--	--	2
Swift	--	--	--	--	--	--	--	--	--	--	--
Waseca	--	4	2	--	--	--	7	--	--	--	25
Yellow Medicine	--	--	--	--	--	1	3	1	--	1	9
Total	1	453	709	0	11	61	205	95	57	17	2,322
STATE TOTAL	62	836	1,608	25	375	1,032	8,004	1,756	159	104	225,471

Table 21.-- Sawtimber removals from timberland for industrial roundwood by Forest Survey Unit, county, and species group, Minnesota, 1988

(In thousand board feet) 1/

Unit and county	Cedar	Balsam fir	Jack pine	Red pine	White pine	Spruce	Tama-rack	Ash	Aspen	Balsam poplar	Bass-wood	White birch
ASPEN-BIRCH UNIT												
Carlton	--	2,565	437	645	201	1,037	23	259	5,757	490	176	827
Cook	244	1,691	2,828	350	433	7,049	--	53	7,682	54	--	1,639
Koochiching	719	3,803	5,775	3,852	753	7,593	1,426	494	46,615	1,209	56	149
Lake	15	1,777	1,057	2,933	3,656	3,353	69	59	14,879	589	--	5,612
St. Louis	313	9,584	11,108	11,062	5,632	7,402	119	368	74,245	4,034	10	4,851
Total	1,291	19,420	21,205	18,842	10,675	26,434	1,637	1,233	149,178	6,376	242	13,078
NORTHERN PINE UNIT												
Aitkin	1	721	307	447	182	301	19	1,356	15,212	1,385	1,397	416
Becker	--	33	1,241	1,266	1,285	28	--	301	13,275	53	474	336
Beltrami	1,120	1,994	5,040	3,415	890	865	120	810	27,265	150	576	1,869
Cass	78	2,190	6,749	8,201	1,876	614	--	266	30,173	177	249	1,449
Clearwater	--	363	1,485	1,068	606	182	7	290	17,132	39	181	128
Crow Wing	--	25	2,143	1,618	339	15	18	274	11,544	47	105	331
Hubbard	1	89	3,998	1,931	905	99	--	93	16,124	99	121	1,052
Itasca	173	9,391	5,383	11,553	2,828	4,140	36	1,402	78,857	1,080	2,110	3,759
Lake of the Woods	28	66	2,783	282	56	336	258	71	1,237	--	15	3
Mahnomen	--	--	163	26	--	--	--	41	3,861	20	25	11
Roseau	5	18	1,983	43	18	56	37	3	34	--	--	2
Wadena	--	12	1,194	498	23	3	--	38	1,280	4	--	3
Total	1,406	14,902	32,469	30,348	9,008	6,639	495	4,945	215,994	3,054	5,253	9,359
CENTRAL HARDWOOD UNIT												
Anoka	--	--	--	6	5	--	--	--	8	--	3	--
Benton	--	--	--	21	--	--	--	2	29	--	45	--
Carver	--	--	--	--	--	--	--	29	3	--	57	--
Chisago	--	--	--	10	1	--	--	62	12	--	149	--
Dakota	--	--	--	--	--	--	--	2	--	--	1	--
Douglas	--	--	--	6	--	--	--	56	7	--	77	--
Fillmore	--	--	--	1	--	--	--	74	70	--	379	--
Goodhue	--	--	--	--	--	--	--	41	45	--	650	--
Hennepin	--	--	--	--	--	--	--	--	19	--	3	--
Houston	--	--	--	--	--	--	--	232	188	--	1,204	--
Isanti	--	4	1	12	72	--	--	56	20	--	253	--
Kanabec	--	9	9	84	14	--	--	102	2,866	3	511	87
Le Sueur	--	--	--	--	--	--	--	--	--	--	1	--
Mille Lacs	--	28	9	9	1	12	--	250	9,436	7	948	55
Morrison	--	--	152	181	29	--	--	96	3,363	1	289	21
Olmstead	--	--	--	--	--	--	--	26	7	--	93	--
Otter Tail	--	--	--	6	40	--	11	170	349	--	304	9
Pine	11	212	354	1,563	170	22	4	478	9,714	872	764	706
Rice	2	--	--	--	--	--	--	112	25	--	376	--
Scott	--	--	--	--	--	--	--	9	9	--	128	--
Sherburne	--	--	7	397	19	3	--	--	9	--	19	--
Stearns	--	--	--	66	15	--	--	170	3	--	255	--
Todd	--	--	83	29	2	--	3	185	1,136	1	522	1
Wabasha	--	--	--	--	3	--	--	279	85	--	752	21
Washington	--	--	--	1	1	--	--	102	5	--	107	--
Winona	--	--	--	2	--	--	--	99	61	--	718	3
Wright	--	--	--	--	1	--	--	4	9	--	20	--
Total	13	253	615	2,394	373	37	18	2,636	27,478	884	8,628	903

(Table 21 continued on next page)

(Table 21 continued)

PRAIRIE UNIT

Unit and county	Cedar	Balsam fir	Jack pine	Red pine	White pine	Spruce	Tama-rack	Ash	Aspen	Balsam poplar	Bass-wood	White birch
Blue Earth	--	--	--	--	--	--	--	4	--	--	6	--
Brown	--	--	--	--	--	--	--	22	--	--	22	--
Chippewa	--	--	--	--	--	--	--	11	--	--	--	--
Clay	--	--	2	2	--	--	--	40	15	--	17	18
Dodge	--	--	--	--	--	--	--	14	--	--	20	--
Faribault	--	--	--	--	--	--	--	51	--	--	--	--
Freeborn	--	--	--	--	--	--	--	--	--	--	--	--
Grant	--	--	--	--	--	--	--	--	--	--	--	--
Jackson	--	--	--	--	--	--	--	1	--	--	--	--
Kandiyohi	--	--	--	--	--	--	--	47	--	--	172	--
Kittson	--	--	--	--	--	--	--	--	--	--	--	--
Lac Qui Parle	--	--	--	--	--	--	--	--	--	--	--	--
Lincoln	--	--	--	--	--	--	--	16	--	--	--	--
Lyon	--	--	--	--	--	--	--	12	--	--	--	--
Mcleod	--	--	--	--	--	--	--	35	7	--	11	--
Marshall	--	--	4	--	--	--	8	1	10	--	--	1
Meeker	--	--	--	--	--	--	--	48	1	--	27	--
Mower	--	--	--	3	--	--	--	--	--	--	--	--
Murray	--	--	--	--	--	--	--	--	--	--	--	--
Nicollet	--	--	--	--	--	--	--	31	--	--	37	--
Nobles	--	--	--	--	--	--	--	3	--	--	--	--
Norman	--	--	--	--	--	--	--	35	10	--	14	14
Pipestone	--	--	--	8	--	--	--	10	--	--	--	--
Polk	4	--	1	2	1	--	7	55	473	1	6	1
Pope	--	--	--	--	--	--	--	26	1	--	48	--
Red Lake	--	--	--	--	--	--	--	2	612	--	--	--
Redwood	--	--	--	--	--	--	--	96	--	--	102	--
Renville	--	--	--	--	3	--	--	69	--	--	73	--
Sibley	--	--	--	--	--	--	--	21	5	--	202	--
Steele	--	--	--	--	--	--	--	--	--	--	--	--
Stevens	--	--	--	--	--	--	--	1	--	--	--	--
Swift	--	--	--	--	--	--	--	--	--	--	--	--
Waseca	--	--	--	--	--	--	--	55	--	--	--	--
Yellow Medicine	--	--	--	--	--	--	--	9	--	--	10	--
Total	4	0	7	15	4	0	15	715	1,134	1	767	34
STATE TOTAL	2,714	34,575	54,296	51,599	20,060	33,110	2,165	9,529	393,784	10,315	14,890	23,374

(Table 21 continued on next page)

(Table 21 continued)

Unit and county	Yellow birch	Cotton-wood	Elm	Hickory	Hard maple	Soft maple	Red oak	White oak	Walnut	O. hard-woods	All species
ASPEN-BIRCH UNIT											
Carlton	--	--	29	--	50	42	170	96	--	--	12,804
Cook	--	--	--	--	--	3	--	--	--	--	22,026
Koochiching	--	--	28	--	--	4	24	36	--	--	72,536
Lake	--	--	--	--	7	19	--	--	--	--	34,025
St. Louis	3	--	3	--	49	332	48	--	--	--	129,163
Total	3	0	60	0	106	400	242	132	0	0	270,554
NORTHERN PINE UNIT											
Aitkin	9	35	68	--	200	77	2,185	110	48	10	24,486
Becker	25	2	103	--	54	125	1,021	245	--	52	19,919
Beltrami	55	--	1,212	--	6	83	286	80	3	--	45,839
Cass	25	--	62	--	8	31	516	51	--	12	52,727
Clearwater	80	3	390	--	11	19	449	56	--	--	22,489
Crow Wing	--	89	7	--	43	32	1,215	138	12	--	17,995
Hubbard	--	--	59	--	38	44	124	4	--	--	24,781
Itasca	--	--	181	--	7	199	562	--	--	--	121,661
Lake of the Woods	14	--	32	--	--	6	2	--	--	--	5,189
Mahnomen	--	--	187	--	--	--	126	27	--	--	4,487
Roseau	--	12	16	--	--	--	1	--	--	--	2,228
Wadena	--	--	2	--	--	--	13	--	--	--	3,070
Total	208	141	2,319	0	367	616	6,500	711	63	74	344,871
CENTRAL HARDWOOD UNIT											
Anoka	--	--	11	--	--	--	76	12	1	1	123
Benton	--	--	17	--	--	--	37	2	--	--	153
Carver	--	50	14	--	6	18	69	66	32	10	354
Chisago	--	--	1	--	--	38	253	103	--	24	653
Dakota	--	51	19	--	2	5	27	17	1	--	125
Douglas	--	9	23	--	9	9	357	96	9	--	667
Fillmore	--	87	181	16	62	45	2,379	491	40	3	3,828
Goodhue	--	262	183	2	124	98	1,347	421	39	3	3,215
Hennepin	--	2	12	--	--	5	10	3	--	--	54
Houston	--	284	227	57	251	218	7,070	1,637	56	53	11,477
Isanti	--	35	2	--	18	32	207	45	--	20	777
Kanabec	--	35	4	--	46	388	802	98	--	16	5,074
Le Sueur	--	5	6	--	1	--	3	1	--	--	17
Mille Lacs	9	91	33	--	53	12	1,073	84	--	--	12,110
Morrison	--	47	32	--	19	12	494	66	--	--	4,802
Olmstead	--	39	47	1	23	23	527	100	3	7	896
Otter Tail	52	7	75	--	2	24	580	164	--	12	1,805
Pine	17	17	78	--	281	358	1,145	350	--	12	17,128
Rice	--	68	102	2	23	99	617	210	165	45	1,846
Scott	--	126	28	--	13	34	87	73	--	--	507
Sherburne	--	--	20	--	--	--	87	1	--	--	562
Stearns	--	41	101	--	10	58	394	105	6	37	1,261
Todd	17	87	40	--	44	--	944	291	--	--	3,385
Wabasha	--	209	371	16	165	334	4,170	780	31	16	7,232
Washington	--	--	8	--	--	69	123	92	--	45	553
Winona	--	177	174	44	93	126	4,058	1,133	53	59	6,800
Wright	--	9	42	--	--	14	87	--	--	--	186
Total	95	1,738	1,851	138	1,245	2,019	27,023	6,441	436	363	85,590

(Table 21 continued on next page)

(Table 21 continued)

PRAIRIE UNIT

Unit and county	Yellow birch	Cotton-wood	Elm	Hickory	Hard maple	Soft maple	Red oak	White oak	Walnut	O. hard-woods	All species
Blue Earth	--	130	7	--	--	5	6	6	25	1	190
Brown	--	351	--	--	--	44	--	--	--	--	439
Chippewa	--	3	3	--	--	--	4	--	--	--	21
Clay	--	4	749	--	--	--	63	12	--	--	922
Dodge	--	2	15	--	14	14	151	11	--	--	241
Faribault	--	84	11	--	--	--	28	2	7	--	183
Freeborn	--	22	5	--	--	--	9	13	--	--	49
Grant	--	1	2	--	--	--	--	--	--	--	3
Jackson	--	5	--	--	--	1	1	--	1	--	9
Kandiyohi	--	51	8	--	24	5	152	40	5	3	507
Kittson	--	--	395	--	--	--	--	--	--	--	395
Lac Qui Parle	--	3	2	--	--	--	--	--	--	--	5
Lincoln	--	83	5	--	--	--	--	--	--	--	104
Lyon	--	72	10	--	--	--	--	--	--	--	94
Mcleod	--	18	17	--	--	--	3	25	--	--	116
Marshall	--	4	400	--	--	--	--	--	--	--	428
Meeker	--	23	25	--	5	--	24	29	5	--	187
Mower	--	10	3	--	--	--	22	35	--	--	73
Murray	--	542	9	--	--	--	--	--	--	--	551
Nicollet	--	489	4	--	--	61	5	3	21	1	652
Nobles	--	20	2	--	--	3	3	--	3	--	34
Norman	--	--	637	--	--	--	55	14	--	--	779
Pipestone	--	--	37	2	--	--	5	--	--	--	62
Polk	7	61	742	--	--	3	43	13	--	--	1,420
Pope	--	7	36	--	5	--	20	45	5	--	193
Red Lake	--	--	158	--	--	--	19	1	--	--	792
Redwood	--	88	--	--	--	73	102	80	112	40	693
Renville	--	--	--	--	--	47	78	60	83	29	442
Sibley	--	24	58	--	3	25	73	23	--	--	434
Steele	--	5	2	--	--	--	5	12	1	--	25
Stevens	--	3	3	--	--	--	1	--	--	--	8
Swift	--	--	1	--	--	--	--	1	--	--	2
Waseca	--	18	14	--	--	--	30	2	3	--	122
Yellow Medicine	--	--	--	--	--	5	10	9	--	3	46
Total	7	2,123	3,360	2	51	286	912	436	271	77	10,221
STATE TOTAL	313	4,002	7,590	140	1,769	3,321	34,677	7,720	770	514	711,236

1/ International 1/4-inch rule.

Table 22.-- Logging residues generated on timberland during industrial roundwood production by Forest Survey Unit, county, and species group, Minnesota, 1988

(In thousand cubic feet)

Unit and county	Cedar	Balsam fir	Jack pine	Red pine	White pine	Spruce	Tamarack	Ash	Aspen	Balsam poplar	Basswood	White birch
ASPEN-BIRCH UNIT												
Carlton	--	477	60	59	15	194	3	30	738	79	20	124
Cook	31	300	372	26	31	1,110	--	1	1,194	10	--	157
Koochiching	89	692	826	393	59	1,391	269	55	7,165	195	6	21
Lake	1	334	144	233	280	589	13	10	2,376	96	--	593
St. Louis	39	1,794	1,548	967	427	1,348	19	41	11,503	651	1	418
Total	160	3,597	2,950	1,678	812	4,632	304	137	22,976	1,031	27	1,313
NORTHERN PINE UNIT												
Aitkin	--	133	40	36	14	57	1	161	2,247	224	166	50
Becker	--	6	160	95	94	4	--	37	2,077	9	56	31
Beltrami	100	373	661	280	67	158	21	95	4,365	23	69	216
Cass	10	352	853	620	139	100	--	29	4,350	29	29	165
Clearwater	--	69	196	83	44	34	1	35	2,736	8	21	15
Crow Wing	--	4	280	126	25	2	2	33	1,669	8	13	36
Hubbard	--	17	524	156	68	20	--	11	2,574	17	15	116
Itasca	21	1,688	713	962	212	758	7	168	12,419	174	252	466
Lake of the Woods	4	8	395	32	4	57	45	9	193	--	1	--
Mahnomen	--	--	21	2	--	--	--	4	622	2	4	1
Roseau	1	2	282	3	1	9	5	--	5	--	--	--
Wadena	--	2	131	37	2	1	--	3	205	1	--	--
Total	136	2,654	4,256	2,432	670	1,200	82	585	33,462	495	626	1,096
CENTRAL HARDWOOD UNIT												
Anoka	--	--	--	--	--	--	--	--	1	--	--	--
Benton	--	--	--	1	--	--	--	--	4	--	4	--
Carver	--	--	--	--	--	--	--	4	--	--	6	--
Chisago	--	--	--	--	--	--	--	7	--	--	13	--
Dakota	--	--	--	--	--	--	--	--	--	--	--	--
Douglas	--	--	--	--	--	--	--	6	2	--	10	1
Fillmore	--	--	--	--	--	--	--	8	11	--	44	--
Goodhue	--	--	--	--	--	--	--	4	5	--	73	--
Hennepin	--	--	--	--	--	--	--	--	3	--	--	--
Houston	--	--	--	--	--	--	--	22	28	--	126	--
Isanti	--	1	--	--	5	--	--	6	1	--	28	--
Kanabec	--	1	1	5	1	--	--	13	244	--	53	9
Le Sueur	--	--	--	--	--	--	--	--	--	--	--	--
Mille Lacs	--	4	1	1	--	2	--	25	884	1	109	3
Morrison	--	--	12	12	2	--	--	12	352	--	35	1
Olmstead	--	--	--	--	--	--	--	4	1	--	12	--
Otter Tail	--	--	--	--	3	--	1	20	26	--	37	1
Pine	1	35	47	121	12	4	--	54	1,353	140	67	99
Rice	--	--	--	--	--	--	--	13	3	--	46	--
Scott	--	--	--	--	--	--	--	1	1	--	15	--
Sherburne	--	--	--	40	1	--	--	--	1	--	2	--
Stearns	--	--	--	4	1	--	--	20	--	--	30	--
Todd	--	--	5	2	--	--	--	21	88	--	62	--
Wabasha	--	--	--	--	--	--	--	32	11	--	84	4
Washington	--	--	--	--	--	--	--	13	1	--	13	--
Winona	--	--	--	--	--	--	--	11	8	--	76	--
Wright	--	--	--	--	--	--	--	--	1	--	3	--
Total	1	41	66	186	25	6	1	296	3,029	141	948	118

(Table 22 continued on next page)

(Table 22 continued)

PRAIRIE UNIT

Unit and county	Cedar	Balsam fir	Jack pine	Red pine	White pine	Spruce	Tama-rack	Ash	Aspen	Balsam poplar	Bass-wood	White birch
Blue Earth	--	--	--	--	--	--	--	--	--	--	--	--
Brown	--	--	--	--	--	--	--	4	--	--	4	--
Chippewa	--	--	--	--	--	--	--	1	--	--	--	--
Clay	--	--	--	--	--	--	--	4	2	--	1	2
Dodge	--	--	--	--	--	--	--	1	--	--	3	--
Faribault	--	--	--	--	--	--	--	6	--	--	--	--
Freeborn	--	--	--	--	--	--	--	--	--	--	--	--
Grant	--	--	--	--	--	--	--	--	--	--	--	--
Jackson	--	--	--	--	--	--	--	--	--	--	--	--
Kandiyohi	--	--	--	--	--	--	--	4	--	--	19	--
Kittson	--	--	--	--	--	--	--	--	--	--	--	--
Lac Qui Parle	--	--	--	--	--	--	--	--	--	--	--	--
Lincoln	--	--	--	--	--	--	--	1	--	--	--	--
Lyon	--	--	--	--	--	--	--	1	--	--	--	--
Mcleod	--	--	--	--	--	--	--	3	2	--	1	--
Marshall	--	--	--	--	--	--	1	--	1	--	--	--
Meeker	--	--	--	--	--	--	--	4	--	--	4	--
Mower	--	--	--	--	--	--	--	--	--	--	--	--
Murray	--	--	--	--	--	--	--	--	--	--	--	--
Nicollet	--	--	--	--	--	--	--	4	--	--	4	--
Nobles	--	--	--	--	--	--	--	--	--	--	--	--
Norman	--	--	--	--	--	--	--	3	1	--	1	1
Pipestone	--	--	--	1	--	--	--	1	--	--	--	--
Polk	--	--	--	--	--	--	1	6	75	--	--	--
Pope	--	--	--	--	--	--	--	4	--	--	4	--
Red Lake	--	--	--	--	--	--	--	--	100	--	--	--
Redwood	--	--	--	--	--	--	--	12	--	--	13	--
Renville	--	--	--	--	--	--	--	9	--	--	9	--
Sibley	--	--	--	--	--	--	--	2	1	--	19	--
Steele	--	--	--	--	--	--	--	--	--	--	--	--
Stevens	--	--	--	--	--	--	--	--	--	--	--	--
Swift	--	--	--	--	--	--	--	--	--	--	--	--
Waseca	--	--	--	--	--	--	--	6	--	--	--	--
Yellow Medicine	--	--	--	--	--	--	--	1	--	--	1	--
Total	0	0	0	1	0	0	2	77	182	0	83	3
STATE TOTAL	297	6,292	7,272	4,297	1,507	5,838	389	1,095	59,649	1,667	1,684	2,530

(Table 22 continued on next page)

(Table 22 continued)

Unit and county	Yellow birch	Cotton-wood	Elm	Hickory	Hard maple	Soft maple	Red oak	White oak	Walnut	O. hard-woods	All species
ASPEN-BIRCH UNIT											
Carlton	--	--	4	--	6	7	37	21	--	--	1,874
Cook	--	--	--	--	--	--	--	--	--	--	3,232
Koochiching	--	--	4	--	--	--	5	8	--	--	11,178
Lake	--	--	--	--	--	4	--	--	--	--	4,673
St. Louis	--	--	--	--	3	11	6	--	--	--	18,776
Total	0	0	8	0	9	22	48	29	0	0	39,733
NORTHERN PINE UNIT											
Aitkin	--	3	6	--	22	13	493	24	4	1	3,695
Becker	4	--	12	--	3	12	231	56	--	6	2,893
Beltrami	6	--	145	--	--	10	65	16	--	--	6,670
Cass	4	--	6	--	--	4	114	10	--	1	6,815
Clearwater	10	--	47	--	1	2	101	13	--	--	3,416
Crow Wing	--	11	1	--	4	4	273	32	1	--	2,524
Hubbard	--	--	6	--	1	2	26	--	--	--	3,553
Itasca	--	--	21	--	--	11	127	--	--	--	17,999
Lake of the Woods	1	--	4	--	--	--	--	--	--	--	753
Mahnomen	--	--	22	--	--	--	29	5	--	--	712
Roseau	--	1	1	--	--	--	--	--	--	--	310
Wadena	--	--	--	--	--	--	3	--	--	--	385
Total	25	15	271	0	31	58	1,462	156	5	8	49,725
CENTRAL HARDWOOD UNIT											
Anoka	--	--	1	--	--	--	18	3	--	--	23
Benton	--	--	1	--	--	--	8	--	--	--	18
Carver	--	6	1	--	--	2	16	16	4	1	56
Chisago	--	--	--	--	--	4	56	24	--	4	108
Dakota	--	6	2	--	--	--	5	3	--	--	16
Douglas	--	1	4	--	1	1	82	21	1	--	130
Fillmore	--	11	21	1	5	4	530	108	5	--	748
Goodhue	--	28	19	--	15	12	305	95	4	--	560
Hennepin	--	--	1	--	--	--	3	--	--	--	7
Houston	--	28	27	6	30	17	1,556	308	6	6	2,160
Isanti	--	3	--	--	2	4	45	11	--	3	109
Kanabec	--	3	--	--	4	45	177	21	--	1	578
Le Sueur	--	--	--	--	--	--	--	--	--	--	0
Mille Lacs	--	11	4	--	4	--	243	19	--	--	1,311
Morrison	--	4	4	--	1	--	111	16	--	--	562
Olmstead	--	4	4	--	4	4	117	24	--	1	175
Otter Tail	6	1	9	--	--	4	131	37	--	1	277
Pine	1	1	9	--	30	42	245	77	--	1	2,339
Rice	--	8	12	--	4	13	140	48	20	4	311
Scott	--	15	4	--	1	3	20	16	--	--	76
Sherburne	--	--	3	--	--	--	19	--	--	--	66
Stearns	--	4	13	--	1	6	91	24	--	4	198
Todd	1	11	4	--	4	--	209	64	--	--	471
Wabasha	--	23	44	1	19	36	926	175	3	1	1,359
Washington	--	--	1	--	--	9	27	21	--	4	89
Winona	--	17	20	4	10	10	877	252	6	6	1,297
Wright	--	1	4	--	--	1	19	--	--	--	29
Total	8	186	212	12	135	217	5,976	1,383	49	37	13,073

(Table 22 continued on next page)

(Table 22 continued)

PRAIRIE UNIT

Unit and county	Yellow birch	Cotton-wood	Elm	Hickory	Hard maple	Soft maple	Red oak	White oak	Walnut	O. hard-woods	All species
Blue Earth	--	15	1	--	--	--	2	2	4	--	24
Brown	--	42	--	--	--	4	--	--	--	--	54
Chippewa	--	--	--	--	--	--	--	--	--	--	1
Clay	--	--	89	--	--	--	13	3	--	--	114
Dodge	--	--	1	--	1	1	34	3	--	--	44
Faribault	--	11	1	--	--	--	6	--	1	--	25
Freeborn	--	4	--	--	--	--	2	3	--	--	9
Grant	--	--	--	--	--	--	--	--	--	--	0
Jackson	--	--	--	--	--	--	--	--	--	--	0
Kandiyohi	--	6	1	--	4	--	34	8	--	--	76
Kittson	--	--	47	--	--	--	--	--	--	--	47
Lac Qui Parle	--	--	--	--	--	--	--	--	--	--	0
Lincoln	--	10	--	--	--	--	--	--	--	--	11
Lyon	--	9	1	--	--	--	--	--	--	--	11
Mcleod	--	2	1	--	--	--	--	5	--	--	14
Marshall	--	--	48	--	--	--	--	--	--	--	50
Meeker	--	4	4	--	--	--	5	7	--	--	28
Mower	--	1	--	--	--	--	5	8	--	--	14
Murray	--	65	1	--	--	--	--	--	--	--	66
Nicollet	--	59	--	--	--	7	--	--	4	--	78
Nobles	--	3	--	--	--	--	--	--	--	--	3
Norman	--	--	77	--	--	--	13	3	--	--	99
Pipestone	--	--	4	--	--	--	--	--	--	--	6
Polk	1	7	88	--	--	--	10	3	--	--	191
Pope	--	1	4	--	--	--	5	10	--	--	28
Red Lake	--	--	19	--	--	--	5	--	--	--	124
Redwood	--	11	--	--	--	9	24	18	13	4	104
Renville	--	--	--	--	--	4	18	13	10	4	67
Sibley	--	4	6	--	--	2	12	3	--	--	49
Steele	--	--	--	--	--	--	--	3	--	--	3
Stevens	--	--	--	--	--	--	--	--	--	--	0
Swift	--	--	--	--	--	--	--	--	--	--	0
Waseca	--	2	1	--	--	--	8	--	--	--	17
Yellow Medicine	--	--	--	--	--	--	3	2	--	--	7
Total	1	256	394	0	5	27	199	94	32	8	1,364
STATE TOTAL	34	457	885	12	180	324	7,685	1,662	86	53	103,895

Table 23.-- Residue produced at primary wood-using mills by type of material, type of use, and county, Minnesota, 1988

(In thousand tons, green weight)

ASPEN-BIRCH UNIT

County and type of use	Wood residue							
	Total		Coarse 1/		Fine 2/		Bark	
	Softwood	Hardwood	Softwood	Hardwood	Softwood	Hardwood	Softwood	Hardwood
Carlton								
Fiber products	49.59	--	49.59	--	--	--	--	--
Industrial fuel	28.87	14.78	--	5.68	28.87	9.10	20.94	5.93
Domestic fuel	0.35	0.36	0.35	0.36	--	--	--	0.02
Miscellaneous 3/	0.14	6.46	--	2.43	0.14	4.03	--	--
Not used	0.03	0.03	--	--	0.03	0.03	0.13	0.12
Total	78.98	21.63	49.94	8.47	29.04	13.16	21.07	6.07
Cook								
Fiber products	15.45	5.15	15.45	5.15	--	--	--	--
Industrial fuel	5.40	3.03	--	0.91	5.40	2.12	3.53	1.55
Domestic fuel	0.26	0.07	0.26	0.07	--	--	0.06	--
Miscellaneous 3/	0.03	--	--	--	0.03	--	--	--
Not used	4.02	1.45	0.19	--	3.83	1.45	2.41	1.06
Total	25.16	9.70	15.90	6.13	9.26	3.57	6.00	2.61
Koochiching								
Fiber products	5.54	11.70	5.54	11.70	--	--	--	--
Industrial fuel	0.23	1.59	0.23	0.88	--	0.71	--	0.34
Domestic fuel	1.49	1.92	1.49	1.92	--	--	0.47	0.74
Miscellaneous 3/	0.24	0.57	--	--	0.24	0.57	--	--
Not used	4.49	8.21	0.33	0.67	4.16	7.54	4.92	5.38
Total	11.99	23.99	7.59	15.17	4.40	8.82	5.39	6.46
Lake								
Fiber products	8.59	--	8.59	--	--	--	--	--
Industrial fuel	5.00	0.07	--	0.04	5.00	0.03	3.58	0.02
Domestic fuel	0.10	0.09	0.10	0.09	--	--	--	--
Miscellaneous 3/	0.04	0.04	--	--	0.04	0.04	--	--
Not used	0.01	0.01	--	--	0.01	0.01	0.03	0.03
Total	13.74	0.21	8.69	0.13	5.05	0.08	3.61	0.05
St. Louis								
Fiber products	4.69	--	4.69	--	--	--	--	--
Charcoal	0.01	0.01	0.01	0.01	--	--	--	--
Industrial fuel	0.11	12.71	0.09	7.51	0.02	5.20	0.01	3.44
Domestic fuel	1.94	1.84	1.94	1.84	--	--	0.29	0.43
Miscellaneous 3/	0.52	0.11	0.03	--	0.49	0.11	--	--
Not used	7.67	4.04	2.71	1.98	4.96	2.06	3.59	1.12
Total	14.94	18.71	9.47	11.34	5.47	7.37	3.89	4.99
All counties								
Fiber products	**83.86**	**16.85**	**83.86**	**16.85**	**--**	**--**	**--**	**--**
Charcoal	**0.01**	**0.01**	**0.01**	**0.01**	**--**	**--**	**--**	**--**
Industrial fuel	**39.61**	**32.18**	**0.32**	**15.02**	**39.29**	**17.16**	**28.06**	**11.28**
Domestic fuel	**4.14**	**4.28**	**4.14**	**4.28**	**--**	**--**	**0.82**	**1.19**
Miscellaneous 3/	**0.97**	**7.18**	**0.03**	**2.43**	**0.94**	**4.75**	**--**	**--**
Not used	**16.22**	**13.74**	**3.23**	**2.65**	**12.99**	**11.09**	**11.08**	**7.71**
Total	**144.81**	**74.24**	**91.59**	**41.24**	**53.22**	**33.00**	**39.96**	**20.18**

(Table 23 continued on next page)

(Table 23 continued)

County and type of use	Wood residue						Bark	
	Total		Coarse 1/		Fine 2/			
	Softwood	Hardwood	Softwood	Hardwood	Softwood	Hardwood	Softwood	Hardwood
NORTHERN PINE UNIT								
Aitkin								
Fiber products	--	0.05	--	0.05	--	--	--	--
Charcoal	0.03	3.38	0.03	3.38	--	--	0.01	1.43
Industrial fuel	0.06	0.99	--	--	0.06	0.99	--	--
Domestic fuel	0.47	3.96	0.45	3.83	0.02	0.13	0.03	1.39
Miscellaneous 3/	0.05	0.79	--	0.03	0.05	0.76	--	--
Not used	0.25	7.82	0.07	3.47	0.18	4.35	0.22	1.71
Total	0.86	16.99	0.55	10.76	0.31	6.23	0.26	4.53
Becker								
Industrial fuel	0.01	0.03	0.01	0.03	--	--	--	--
Domestic fuel	1.79	1.44	1.79	1.44	--	--	0.25	0.39
Miscellaneous 3/	0.27	0.42	--	--	0.27	0.42	--	--
Not used	2.97	2.94	1.39	1.58	1.58	1.36	1.09	0.92
Total	5.04	4.83	3.19	3.05	1.85	1.78	1.34	1.31
Beltrami								
Fiber products	--	7.69	--	7.69	--	--	--	--
Industrial fuel	2.05	4.92	1.68	0.86	0.37	4.06	1.16	3.33
Domestic fuel	0.78	1.24	0.76	1.22	0.02	0.02	0.17	0.43
Miscellaneous 3/	1.75	1.13	1.05	--	0.70	1.13	0.09	--
Not used	1.98	9.49	0.66	5.71	1.32	3.78	0.70	2.81
Total	6.56	24.47	4.15	15.48	2.41	8.99	2.12	6.57
Cass								
Fiber products	7.06	--	7.06	--	--	--	--	--
Industrial fuel	5.76	11.17	2.31	7.26	3.45	3.91	2.97	3.08
Domestic fuel	3.39	2.32	3.26	2.25	0.13	0.07	1.16	0.89
Miscellaneous 3/	0.95	0.14	--	--	0.95	0.14	--	--
Not used	13.90	2.44	7.02	0.68	6.88	1.76	4.16	0.36
Total	31.06	16.07	19.65	10.19	11.41	5.88	8.29	4.33
Clearwater								
Fiber products	3.62	6.01	3.62	6.01	--	--	--	--
Industrial fuel	--	2.96	--	0.01	--	2.95	--	2.23
Domestic fuel	0.22	0.93	0.22	0.93	--	--	0.02	0.30
Miscellaneous 3/	0.26	0.17	--	--	0.26	0.17	--	--
Not used	2.23	2.56	0.18	1.02	2.05	1.54	1.67	0.97
Total	6.33	12.63	4.02	7.97	2.31	4.66	1.69	3.50
Crow Wing								
Industrial fuel	0.04	0.06	0.04	0.06	--	--	0.02	0.03
Domestic fuel	0.99	2.56	0.99	2.56	--	--	0.27	0.94
Miscellaneous 3/	0.51	0.26	--	--	0.51	0.26	--	--
Not used	0.12	7.96	0.03	4.23	0.09	3.73	0.18	1.96
Total	1.66	10.84	1.06	6.85	0.60	3.99	0.47	2.93

(Table 23 continued on next page)

(Table 23 continued)

County and type of use	Wood residue							
	Total		Coarse 1/		Fine 2/		Bark	
	Softwood	Hardwood	Softwood	Hardwood	Softwood	Hardwood	Softwood	Hardwood
Hubbard								
Industrial fuel	1.70	0.21	1.69	0.16	0.01	0.05	0.72	0.06
Domestic fuel	3.40	2.50	3.20	2.30	0.20	0.20	1.34	0.97
Miscellaneous 3/	1.03	0.31	--	--	1.03	0.31	0.09	--
Not used	1.97	1.19	0.23	0.20	1.74	0.99	0.12	0.12
Total	8.10	4.21	5.12	2.66	2.98	1.55	2.27	1.15
Itasca								
Fiber products	16.63	22.77	16.63	22.77	--	--	--	--
Industrial fuel	17.91	43.12	5.21	19.25	12.70	23.87	8.46	17.85
Domestic fuel	1.32	2.05	1.32	2.05	--	--	0.26	0.65
Miscellaneous 3/	0.30	0.55	--	--	0.30	0.55	--	--
Not used	1.04	2.35	0.35	0.70	0.69	1.65	0.38	0.50
Total	37.20	70.84	23.51	44.77	13.69	26.07	9.10	19.00
Lake of the Woods								
Fiber products	0.13	2.55	0.13	2.55	--	--	--	--
Industrial fuel	0.27	--	--	--	0.27	--	0.01	0.27
Domestic fuel	2.08	0.07	2.08	0.07	--	--	0.83	0.02
Miscellaneous 3/	0.04	--	--	--	0.04	--	--	--
Not used	1.73	1.77	0.48	0.16	1.25	1.61	0.20	0.88
Total	4.25	4.39	2.69	2.78	1.56	1.61	1.04	1.17
Mahnomen								
Industrial fuel	--	0.05	--	0.05	--	--	--	--
Domestic fuel	0.01	1.13	0.01	1.13	--	--	--	0.46
Miscellaneous 3/	--	0.02	--	--	--	0.02	--	0.00
Not used	--	1.60	--	0.59	--	1.01	--	0.29
Total	0.01	2.80	0.01	1.77	--	1.03	--	0.75
Roseau								
Industrial fuel	--	0.35	--	--	--	0.35	--	--
Domestic fuel	0.07	0.92	0.07	0.10	--	0.82	--	0.01
Not used	0.14	2.08	0.07	2.02	0.07	0.06	0.04	0.89
Total	0.21	3.35	0.14	2.12	0.07	1.23	0.04	0.90
Wadena								
Industrial fuel	--	1.47	--	--	--	1.47	--	--
Domestic fuel	0.39	8.60	0.39	8.60	--	--	0.16	3.65
Miscellaneous 3/	1.63	1.74	1.42	--	0.21	1.74	0.96	0.00
Not used	0.86	5.73	0.01	2.50	0.85	3.23	0.04	1.06
Total	2.88	17.54	1.82	11.10	1.06	6.44	1.16	4.71
All counties								
Fiber products	**27.44**	**39.07**	**27.44**	**39.07**	**--**	**--**	**--**	**--**
Charcoal	**0.03**	**3.38**	**0.03**	**3.38**	**--**	**--**	**0.01**	**1.43**
Industrial fuel	**27.80**	**65.33**	**10.94**	**27.68**	**16.86**	**37.65**	**13.34**	**26.85**
Domestic fuel	**14.91**	**27.72**	**14.54**	**26.48**	**0.37**	**1.24**	**4.49**	**10.10**
Miscellaneous 3/	**6.79**	**5.53**	**2.47**	**0.03**	**4.32**	**5.50**	**1.14**	**--**
Not used	**27.19**	**47.93**	**10.49**	**22.86**	**16.70**	**25.07**	**8.80**	**12.47**
Total	**104.16**	**188.96**	**65.91**	**119.50**	**38.25**	**69.46**	**27.78**	**50.85**

(Table 23 continued on next page)

(Table 23 continued)

County and type of use	Wood residue							
	Total		Coarse 1/		Fine 2/		Bark	
	Softwood	Hardwood	Softwood	Hardwood	Softwood	Hardwood	Softwood	Hardwood
CENTRAL HARDWOOD UNIT								
Anoka								
Charcoal	0.01	0.01	0.01	0.01	--	--	0.01	0.01
Industrial fuel	--	--	--	--	--	--	--	1.98
Domestic fuel	--	0.07	--	0.07	--	--	--	0.03
Miscellaneous 3/	0.01	0.11	--	0.04	0.01	0.07	--	0.02
Not used	--	--	--	--	--	--	--	0.10
Total	0.02	0.19	0.01	0.12	0.01	0.07	0.01	2.14
Benton								
Industrial fuel	--	--	--	--	--	--	0.59	4.16
Domestic fuel	0.03	0.61	0.03	0.61	--	--	--	0.23
Miscellaneous 3/	0.02	0.35	--	--	0.02	0.35	--	--
Not used	--	--	--	--	--	--	0.01	0.03
Total	0.05	0.96	0.03	0.61	0.02	0.35	0.60	4.42
Carver								
Domestic fuel	--	0.20	--	0.20	--	--	--	0.08
Miscellaneous 3/	--	0.15	--	--	--	0.15	--	--
Not used	--	0.04	--	0.04	--	--	--	0.02
Total	--	0.39	--	0.24	--	0.15	--	0.10
Chisago								
Domestic fuel	0.06	0.09	0.06	0.09	--	--	--	0.01
Miscellaneous 3/	--	0.02	--	--	--	0.02	0.02	--
Not used	0.04	0.04	--	--	0.04	0.04	0.08	0.03
Total	0.10	0.15	0.06	0.09	0.04	0.06	0.10	0.04
Dakota								
Industrial fuel	--	0.01	--	0.01	--	--	--	--
Domestic fuel	--	0.05	--	0.05	--	--	--	0.02
Miscellaneous 3/	--	0.03	--	--	--	0.03	--	0.01
Total	--	0.09	--	0.06	--	0.03	--	0.03
Douglas								
Domestic fuel	0.01	0.40	0.01	0.40	--	--	--	0.13
Miscellaneous 3/	0.01	0.21	--	--	0.01	0.21	--	--
Not used	--	0.04	--	--	--	0.04	--	0.05
Total	0.02	0.65	0.01	0.40	0.01	0.25	--	0.18
Fillmore								
Industrial fuel	--	0.01	--	0.01	--	--	--	--
Domestic fuel	--	0.13	--	0.13	--	--	--	0.06
Miscellaneous 3/	--	7.52	--	5.75	--	1.77	--	3.02
Not used	--	22.03	--	12.88	--	9.15	--	4.91
Total	--	29.69	--	18.77	--	10.92	--	7.99
Goodhue								
Charcoal	--	0.01	--	0.01	--	--	--	0.01
Domestic fuel	--	0.06	--	0.06	--	--	--	0.03
Miscellaneous 3/	--	3.01	--	1.37	--	1.64	--	1.17
Not used	--	1.37	--	1.37	--	--	--	--
Total	--	4.45	--	2.81	--	1.64	--	1.21

(Table 23 continued on next page)

(Table 23 continued)

County and type of use	Wood residue						Bark	
	Total		Coarse 1/		Fine 2/			
	Softwood	Hardwood	Softwood	Hardwood	Softwood	Hardwood	Softwood	Hardwood
Hennepin								
Domestic fuel	--	0.33	--	0.33	--	--	--	0.14
Miscellaneous 3/	--	0.20	--	--	--	0.20	--	--
Total	--	0.53	--	0.33	--	0.20	--	0.14
Houston								
Industrial fuel	--	9.13	--	5.18	--	3.95	--	2.95
Domestic fuel	--	6.67	--	6.47	--	0.20	--	0.33
Miscellaneous 3/	--	11.60	--	4.91	--	6.69	--	4.99
Not used	--	3.55	--	2.68	--	0.87	--	--
Total	--	30.95	--	19.24	--	11.71	--	8.27
Isanti								
Domestic fuel	0.12	0.49	0.12	0.49	--	--	0.04	0.19
Miscellaneous 3/	0.07	0.29	--	--	0.07	0.29	--	--
Not used	--	--	--	--	--	--	0.09	0.02
Total	0.19	0.78	0.12	0.49	0.07	0.29	0.13	0.21
Kanabec								
Domestic fuel	--	0.37	--	0.37	--	--	--	0.11
Miscellaneous 3/	--	0.22	--	--	--	0.22	--	--
Not used	--	--	--	--	--	--	--	0.04
Total	--	0.59	--	0.37	--	0.22	--	0.15
Le Sueur								
Domestic fuel	--	0.28	--	0.28	--	--	--	0.01
Miscellaneous 3/	--	0.17	--	--	--	0.17	--	0.11
Total	--	0.45	--	0.28	--	0.17	--	0.12
Mille Lacs								
Fiber products	--	9.59	--	9.59	--	--	--	4.08
Industrial fuel	--	4.28	--	4.28	--	--	--	0.51
Domestic fuel	0.01	0.27	0.01	0.27	--	--	--	0.00
Miscellaneous 3/	--	10.30	--	3.23	--	7.07	--	2.67
Not used	--	3.07	--	0.02	--	3.05	--	0.15
Total	0.01	27.51	0.01	17.39	--	10.12	--	7.41
Morrison								
Domestic fuel	0.15	0.33	0.15	0.33	--	--	--	0.03
Miscellaneous 3/	0.07	0.14	--	--	0.07	0.14	--	--
Not used	0.01	0.01	--	--	0.01	0.01	0.07	0.11
Total	0.23	0.48	0.15	0.33	0.08	0.15	0.07	0.14
Olmsted								
Industrial fuel	--	0.02	--	0.02	--	--	--	--
Domestic fuel	--	0.12	--	0.12	--	--	--	0.04
Miscellaneous 3/	--	0.30	--	0.13	--	0.17	--	0.06
Not used	--	0.02	--	0.01	--	0.01	--	0.03
Total	--	0.46	--	0.28	--	0.18	--	0.13

(Table 23 continued on next page)

(Table 23 continued)

County and type of use	Wood residue						Bark	
	Total		Coarse 1/		Fine 2/			
	Softwood	Hardwood	Softwood	Hardwood	Softwood	Hardwood	Softwood	Hardwood
Otter Tail								
Industrial fuel	--	0.06	--	0.06	--	--	--	--
Domestic fuel	0.05	0.89	0.05	0.81	--	0.08	--	0.24
Miscellaneous 3/	--	0.26	--	--	--	0.26	--	0.30
Not used	0.07	0.21	0.03	0.03	0.04	0.18	0.04	0.14
Total	0.12	1.42	0.08	0.90	0.04	0.52	0.04	0.68
Pine								
Industrial fuel	1.09	2.32	1.09	2.32	--	--	0.42	0.98
Domestic fuel	0.65	6.67	0.59	6.46	0.06	0.21	0.18	2.67
Miscellaneous 3/	0.12	1.03	--	--	0.12	1.03	--	--
Not used	3.58	7.68	1.77	2.43	1.81	5.25	0.80	1.11
Total	5.44	17.70	3.45	11.21	1.99	6.49	1.40	4.76
Ramsey								
Domestic fuel	--	0.14	--	0.14	--	--	--	0.09
Miscellaneous 3/	--	0.24	--	--	--	0.24	--	--
Total	--	0.38	--	0.14	--	0.24	--	0.09
Rice								
Domestic fuel	--	0.09	--	0.09	--	--	--	--
Miscellaneous 3/	--	0.07	--	0.01	--	0.06	--	--
Not used	--	--	--	--	--	--	--	0.04
Total	--	0.16	--	0.10	--	0.06	--	0.04
Scott								
Industrial fuel	--	0.57	--	0.36	--	0.21	--	0.15
Domestic fuel	--	0.11	--	0.11	--	--	--	0.05
Miscellaneous 3/	--	0.07	--	--	--	0.07	--	--
Total	--	0.75	--	0.47	--	0.28	--	0.20
Sherburne								
Industrial fuel	--	--	--	--	--	--	--	0.06
Domestic fuel	0.01	0.15	0.01	0.15	--	--	--	0.01
Miscellaneous 3/	--	0.17	--	--	--	0.17	--	0.00
Not used	--	--	--	--	--	--	--	0.02
Total	0.01	0.32	0.01	0.15	--	0.17	--	0.09
Stearns								
Domestic fuel	0.14	1.57	0.14	1.57	--	--	0.06	0.53
Miscellaneous 3/	0.19	1.37	--	--	0.19	1.37	--	--
Not used	0.20	0.78	0.20	0.78	--	--	0.08	0.48
Total	0.53	3.72	0.34	2.35	0.19	1.37	0.14	1.01
Todd								
Industrial fuel	--	0.40	--	0.40	--	--	0.03	0.73
Domestic fuel	0.12	1.25	0.12	1.25	--	--	--	0.43
Miscellaneous 3/	0.06	0.84	--	--	0.06	0.84	--	--
Not used	0.01	0.59	--	0.30	0.01	0.29	0.04	0.23
Total	0.19	3.08	0.12	1.95	0.07	1.13	0.07	1.39
Wabasha								
Domestic fuel	--	1.79	--	1.79	--	--	--	0.04
Miscellaneous 3/	--	1.05	--	--	--	1.05	--	0.74
Not used	--	0.13	--	0.09	--	0.04	--	0.03
Total	--	2.97	--	1.88	--	1.09	--	0.81

(Table 23 continued on next page)

(Table 23 continued)

County and type of use	Wood residue							
	Total		Coarse 1/		Fine 2/		Bark	
	Softwood	Hardwood	Softwood	Hardwood	Softwood	Hardwood	Softwood	Hardwood
Washington								
Industrial fuel	--	0.04	--	--	--	0.04	--	0.03
Domestic fuel	--	0.06	--	0.06	--	--	--	0.03
Miscellaneous 3/	--	0.16	--	0.13	--	0.03	--	--
Not used	--	0.04	--	--	--	0.04	--	0.03
Total	--	0.30	--	0.19	--	0.11	--	0.09
Winona								
Domestic fuel	--	0.46	--	0.46	--	--	--	0.20
Miscellaneous 3/	--	0.27	--	--	--	0.27	--	--
Total	--	0.73	--	0.46	--	0.27	--	0.20
Wright								
Domestic fuel	--	0.18	--	0.18	--	--	--	0.06
Miscellaneous 3/	--	0.11	--	--	--	0.11	--	--
Not used	--	--	--	--	--	--	--	0.02
Total	--	0.29	--	0.18	--	0.11	--	0.08
All counties								
Fiber products	**--**	**9.59**	**--**	**9.59**	**--**	**--**	**--**	**4.08**
Charcoal	**0.01**	**0.02**	**0.01**	**0.02**	**--**	**--**	**0.01**	**0.02**
Industrial fuel	**1.09**	**16.84**	**1.09**	**12.64**	**--**	**4.20**	**1.04**	**11.55**
Domestic fuel	**1.35**	**23.83**	**1.29**	**23.34**	**0.06**	**0.49**	**0.28**	**5.79**
Miscellaneous 3/	**0.55**	**40.26**	**--**	**15.57**	**0.55**	**24.69**	**0.02**	**13.09**
Not used	**3.91**	**39.60**	**2.00**	**20.63**	**1.91**	**18.97**	**1.21**	**7.59**
Total	**6.91**	**130.14**	**4.39**	**81.79**	**2.52**	**48.35**	**2.56**	**42.12**
PRAIRIE UNIT								
Blue Earth								
Domestic fuel	--	0.03	--	0.03	--	--	--	0.03
Miscellaneous 3/	--	0.03	--	--	--	0.03	--	--
Total	--	0.06	--	0.03	--	0.03	--	0.03
Chippewa								
Domestic fuel	--	0.01	--	0.01	--	--	--	--
Miscellaneous 3/	--	--	--	--	--	--	--	--
Total	--	0.01	--	0.01	--	--	--	--
Clay								
Industrial fuel	--	0.01	--	0.01	--	--	--	--
Domestic fuel	0.01	0.09	0.01	0.09	--	--	--	--
Miscellaneous 3/	--	0.01	--	--	--	0.01	--	--
Not used	--	0.05	--	--	--	0.05	--	0.05
Total	0.01	0.16	0.01	0.10	--	0.06	--	0.05
Faribault								
Domestic fuel	--	0.09	--	0.09	--	--	--	0.04
Miscellaneous 3/	--	0.06	--	--	--	0.06	--	0.00
Total	--	0.15	--	0.09	--	0.06	--	0.04

(Table 23 continued on next page)

(Table 23 continued)

County and type of use	Wood residue						Bark	
	Total		Coarse 1/		Fine 2/			
	Softwood	Hardwood	Softwood	Hardwood	Softwood	Hardwood	Softwood	Hardwood
Freeborn								
Domestic fuel	--	0.51	--	0.51	--	--	--	0.22
Miscellaneous 3/	--	1.05	--	--	--	1.05	--	--
Not used	--	1.29	--	1.29	--	--	--	0.55
Total	--	2.85	--	1.80	--	1.05	--	0.77
Kandiyohi								
Domestic fuel	--	0.12	--	0.12	--	--	--	0.05
Miscellaneous 3/	--	0.06	--	--	--	0.06	--	--
Total	--	0.18	--	0.12	--	0.06	--	0.05
Lac Qui Parle								
Domestic fuel	--	0.01	--	0.01	--	--	--	--
Miscellaneous 3/	--	--	--	--	--	--	--	--
Total	--	0.01	--	0.01	--	--	--	--
Lincoln								
Domestic fuel	--	0.17	--	0.17	--	--	--	0.07
Miscellaneous 3/	--	0.10	--	--	--	0.10	--	--
Not used	--	0.27	--	0.17	--	0.10	--	0.07
Total	--	0.54	--	0.34	--	0.20	--	0.14
Lyon								
Domestic fuel	--	0.02	--	0.02	--	--	--	0.01
Miscellaneous 3/	--	0.01	--	--	--	0.01	--	--
Total	--	0.03	--	0.02	--	0.01	--	0.01
Mcleod								
Domestic fuel	--	0.17	--	0.17	--	--	--	0.08
Miscellaneous 3/	--	0.10	--	--	--	0.10	--	--
Total	--	0.27	--	0.17	--	0.10	--	0.08
Marshall								
Industrial fuel	--	0.01	--	0.01	--	--	--	--
Domestic fuel	0.04	0.07	0.04	0.07	--	--	--	--
Miscellaneous 3/	--	--	--	--	--	--	--	--
Not used	0.02	0.04	--	--	0.02	0.04	0.01	0.03
Total	0.06	0.12	0.04	0.08	0.02	0.04	0.01	0.03
Martin								
Industrial fuel	--	0.43	--	0.27	--	0.16	--	0.11
Total	--	0.43	--	0.27	--	0.16	--	0.11
Meeker								
Domestic fuel	--	0.73	--	0.73	--	--	--	0.32
Miscellaneous 3/	--	0.42	--	--	--	0.42	--	--
Total	--	1.15	--	0.73	--	0.42	--	0.32
Mower								
Domestic fuel	0.01	0.13	0.01	0.13	--	--	--	0.05
Miscellaneous 3/	--	0.07	--	--	--	0.07	--	--
Not used	--	0.02	--	0.01	--	0.01	--	0.01
Total	0.01	0.22	0.01	0.14	--	0.08	--	0.06
Murray								
Domestic fuel	--	0.07	--	0.07	--	--	--	0.03
Miscellaneous 3/	--	0.04	--	--	--	0.04	--	--
Total	--	0.11	--	0.07	--	0.04	--	0.03

(Table 23 continued on next page)

(Table 23 continued)

County and type of use	Wood residue							
	Total		Coarse 1/		Fine 2/		Bark	
	Softwood	Hardwood	Softwood	Hardwood	Softwood	Hardwood	Softwood	Hardwood
Nicollet								
Domestic fuel	--	0.13	--	0.11	--	0.02	--	0.05
Miscellaneous 3/	--	10.75	--	6.20	--	4.55	--	2.64
Not used	--	1.69	--	1.64	--	0.05	--	0.70
Total	--	12.57	--	7.95	--	4.62	--	3.39
Nobles								
Domestic fuel	--	0.07	--	0.07	--	--	--	--
Miscellaneous 3/	--	0.04	--	--	--	0.04	--	--
Not used	--	--	--	--	--	--	--	0.03
Total	--	0.11	--	0.07	--	0.04	--	0.03
Norman								
Domestic fuel	--	1.38	--	1.38	--	--	--	0.59
Miscellaneous 3/	--	0.16	--	--	--	0.16	--	--
Not used	--	0.64	--	--	--	0.64	--	--
Total	--	2.18	--	1.38	--	0.80	--	0.59
Polk								
Domestic fuel	0.03	0.21	0.02	0.18	0.01	0.03	--	--
Miscellaneous 3/	0.01	0.02	--	--	0.01	0.02	--	--
Not used	--	0.08	--	0.01	--	0.07	--	0.09
Total	0.04	0.31	0.02	0.19	0.02	0.12	--	0.09
Pope								
Domestic fuel	--	0.09	--	0.09	--	--	--	--
Miscellaneous 3/	--	0.03	--	--	--	0.03	--	--
Not used	--	0.03	--	--	--	0.03	--	0.04
Total	--	0.15	--	0.09	--	0.06	--	0.04
Red Lake								
Domestic fuel	--	0.05	--	0.05	--	--	--	0.02
Not used	--	0.02	--	--	--	0.02	--	--
Total	--	0.07	--	0.05	--	0.02	--	0.02
Renville								
Domestic fuel	--	0.01	--	0.01	--	--	--	--
Miscellaneous 3/	--	--	--	--	--	--	--	--
Total	--	0.01	--	0.01	--	--	--	--
Sibley								
Industrial fuel	--	0.03	--	0.03	--	--	--	0.01
Domestic fuel	--	0.56	--	0.56	--	--	--	0.23
Miscellaneous 3/	--	1.07	--	0.43	--	0.64	--	0.18
Not used	--	0.20	--	0.14	--	0.06	--	0.08
Total	--	1.86	--	1.16	--	0.70	--	0.50
Stevens								
Domestic fuel	--	0.01	--	0.01	--	--	--	--
Miscellaneous 3/	--	0.01	--	--	--	0.01	--	--
Not used	--	--	--	--	--	--	--	0.01
Total	--	0.02	--	0.01	--	0.01	--	0.01

(Table 23 continued on next page)

(Table 23 continued)

County and type of use	Wood residue							
	Total		Coarse 1/		Fine 2/		Bark	
	Softwood	Hardwood	Softwood	Hardwood	Softwood	Hardwood	Softwood	Hardwood
Waseca								
Domestic fuel	--	0.07	--	0.07	--	--	--	0.03
Miscellaneous 3/	--	0.04	--	--	--	0.04	--	0.00
Total	--	0.11	--	0.07	--	0.04	--	0.03
All counties								
Industrial fuel	**--**	**0.48**	**--**	**0.32**	**--**	**0.16**	**--**	**0.12**
Domestic fuel	**0.09**	**4.80**	**0.08**	**4.75**	**0.01**	**0.05**	**--**	**1.82**
Miscellaneous 3/	**0.01**	**14.07**	**--**	**6.63**	**0.01**	**7.44**	**--**	**2.82**
Not used	**0.02**	**4.33**	**--**	**3.26**	**0.02**	**1.07**	**0.01**	**1.66**
Total	**0.12**	**23.68**	**0.08**	**14.96**	**0.04**	**8.72**	**0.01**	**6.42**
				ALL UNITS				
All counties								
Fiber products	**111.30**	**65.51**	**111.30**	**65.51**	**--**	**--**	**--**	**4.08**
Charcoal	**0.05**	**3.41**	**0.05**	**3.41**	**--**	**--**	**0.02**	**1.45**
Industrial fuel	**68.50**	**114.83**	**12.35**	**55.66**	**56.15**	**59.17**	**42.44**	**49.80**
Domestic fuel	**20.49**	**60.63**	**20.05**	**58.85**	**0.44**	**1.78**	**5.59**	**18.90**
Miscellaneous 3/	**8.32**	**67.04**	**2.50**	**24.66**	**5.82**	**42.38**	**1.16**	**15.91**
Not used	**47.34**	**105.60**	**15.72**	**49.40**	**31.62**	**56.20**	**21.10**	**29.43**
Total	**256.00**	**417.02**	**161.97**	**257.49**	**94.03**	**159.53**	**70.31**	**119.57**

1/ Suitable for chipping such as slabs,edgings,veneer cores,etc.

2/ Not suitable for chipping such as sawdust,veneer clippings,etc.

3/ Livestock bedding, mulch, small dimension, and specialty items.

Smith, W. Brad; Dahlman, Rick.
1991. **Minnesota timber industry—an assessment of timber product output and use, 1988.** Resour. Bull. NC-127. St. Paul, MN: U.S. Department of Agriculture, Forest Service, North Central Forest Experiment Station. 61 p.

Discusses recent Minnesota forest industry trends; production and receipts of pulpwood, saw logs and veneer logs; and production of other timber products in 1988. Reports on logging residue, wood and bark residue generated at primary wood-using mills, and disposition of mill residues.

KEY WORDS: Pulpwood, saw logs, veneer logs, residue

Our job at the North Central Forest Experiment Station is discovering and creating new knowledge and technology in the field of natural resources and conveying this information to the people who can use it. As a new generation of forests emerges in our region, managers are confronted with two unique challenges: (1) Dealing with the great diversity in composition, quality, and ownership of the forests, and (2) Reconciling the conflicting demands of the people who use them. Helping the forest manager meet these challenges while protecting the environment is what research at North Central is all about.